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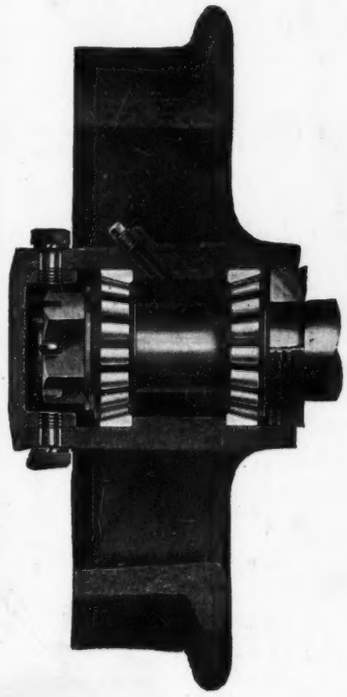
Recovering Top Coal and Old Pillars at Hiawatha, p. 389

COAL AGE

The World's Accepted Authority on Coal Mining

McGraw-Hill Publishing Company, Inc. **September 16, 1926** Price Twenty Cents per Copy



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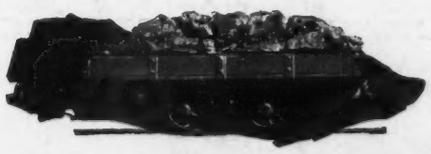
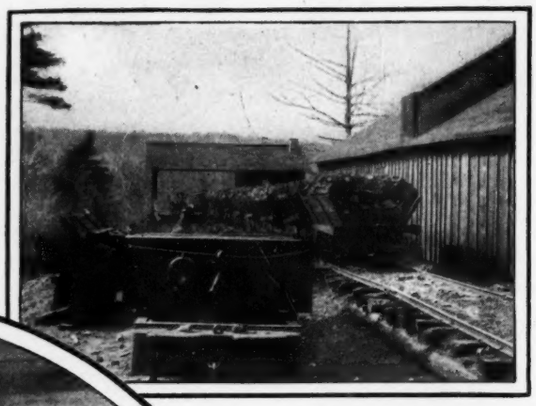


Efficient on charge

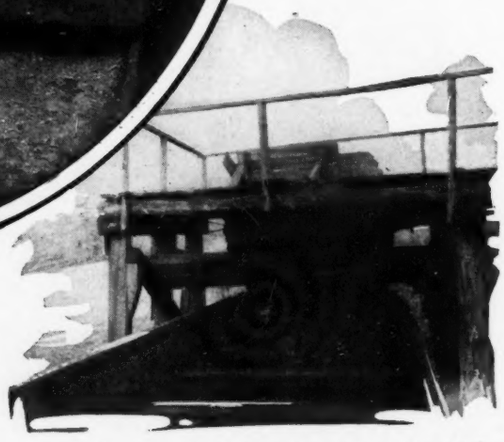
The efficiency of the Exide-Ironclad Battery does not end when it leaves the haulageway and enters the motor barn. So efficient is this battery on charge that you have to put but little more current in than you take out. This means quicker, easier charging; it means less operating expense; and it means that batteries always start out fully charged even when they work under pressure and time is at a premium.



This little motor has just pulled nine heavily topped cars up a steep grade, though it has already been working for several hours. All the motorman had to do was sand the wheels, and the motor breezed ahead without faltering, for in the battery box was an Exide-Ironclad—the battery that always has power in reserve and can deliver it in a rush when needed.

Each tag represents a car of coal that some miner has produced. How many tags there will be on the board at the shift's end depends in large part upon whether your gathering motors are equipped with powerful, peppy Exide-Ironclad Batteries.

Here are three rugged brutes of locomotives, and in the battery box of each is an Exide-Ironclad Battery. The construction of this battery is in keeping with the conditions under which it works. All about are rock, steel and huge timbers, yet so ruggedly built is the Exide-Ironclad that it takes its bumps and jolts and hardly ever needs any repairs.



You can tell from the size of the tipple that this partly filled car of coal is at a small mine. In this type of mine just as much as at a large operation it is important to use a speedy, powerful, dependable battery like the Exide-Ironclad, for if anything happens to the haulage service, the entire mine is held up.

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Devoted to the Operating, Technical and Business Problems of the Coal-Mining Industry

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COAL AGE

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Three Owners, One Mine and One Chief Customer

All the State of Indiana regards the Wabash River with affection. Next week Frank H. Kneeland will describe a new mine, not yet fully developed, that has been sunk upon its western shore. This operation will produce coal from the properties of three separate owners, one of which is the Commonwealth of Indiana. The state's coal lies under the river bed, the stream being considered navigable at this point. No pillars will be drawn, yet it is anticipated that the degree of extraction will approximate 60 per cent. Under normal conditions all of the small coal will be sold to a power company whose plant adjoins the mine so closely that this fuel is delivered to the boiler bunkers by belt conveyors. In time, as the output approaches mine capacity, domestic sizes of fuel will be prepared and shipped. The tipple machinery is ingeniously interlocked to prevent a wrong sequence in starting and stopping.

The Rocky Mountain Coal Mining Institute

Out in Colorado the Rocky Mountain Coal Mining Institute is holding one of its annual sessions. *Coal Age* has taken an active interest in this organization ever since its inception many years ago. Next week R. Dawson Hall, engineering editor, will report its proceedings. It is always wise and helpful for coal men with interests in common to get together and discuss their mutual problems. Even if this were the final benefits derivable much good would be accomplished. Through the medium of publicity, however, the valuable experience of the individual mine or group of mines becomes the common property of humanity, enriches the knowledge of the entire industry and indirectly benefits the race itself.

Enough and To Spare

Next week, also, J. P. Rowe will tell us about the vast coal deposits of Montana. These are bigger than those of any other state. Mr. Rowe will show that at the present rate of production Montana has enough of this fuel to meet her needs for 900 centuries. So far as scientists are able to judge man has now been on this planet for from 10,000 to 20,000 years. It will thus be seen that the future residents of Montana may be warming their homes and cooking their food with coal fires when we who tread the earth today represent to them what the Missing Link does to us.

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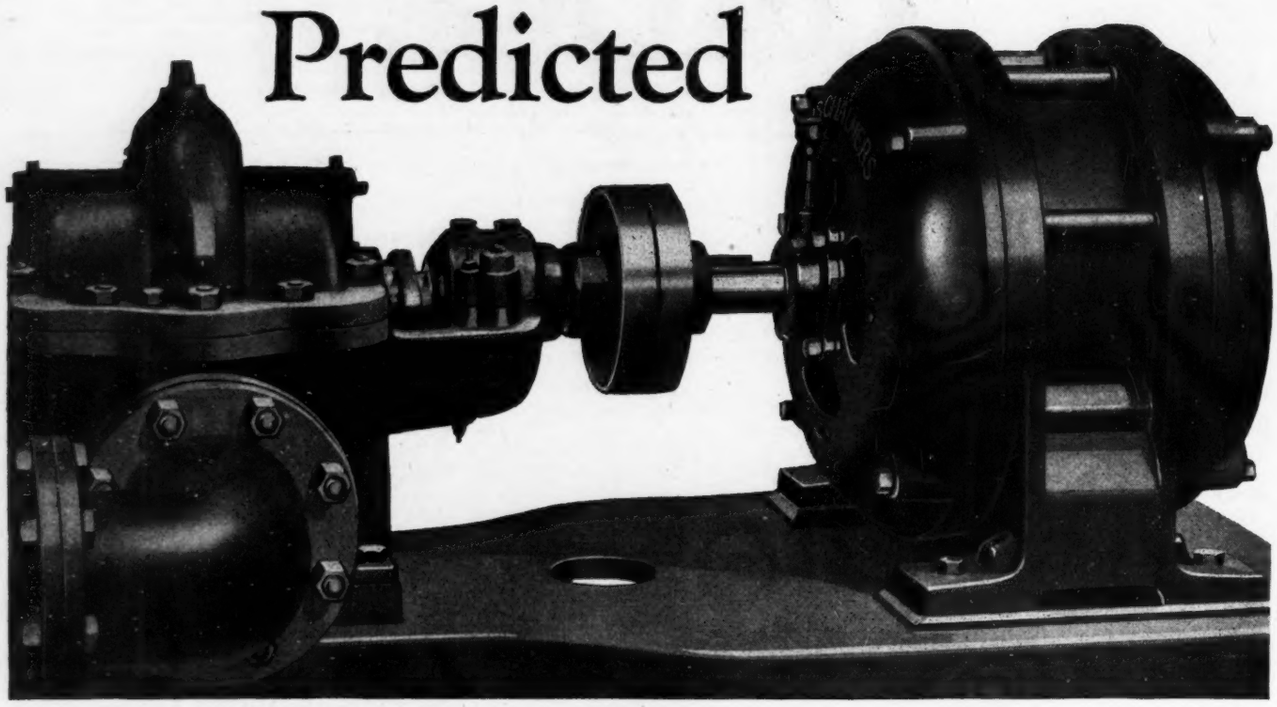

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COAL AGE

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Devoted to the Operating, Technical and Business Problems of the Coal-Mining Industry

R. DAWSON HALL
Engineering Editor

Volume 30 NEW YORK, SEPTEMBER 16, 1926 Number 12

In Time of Need

EVER SINCE the late war taught the use of poison gas and likewise the means of avoiding its horrors, the self-rescuer has held a more or less prominent place in the equipment of many American coal mines. Some companies went so far as to provide each and every one of their employees with equipments of this kind. Unfortunately, however, they cannot compel their men to learn their use and in many cases they have been unable to induce them to so much as carry them.

A practical demonstration of the utility of these devices, if reports emanating from Clymer are to be credited, was furnished by the recent explosion at that place. Although the company owning this mine had provided self-rescuers for all of its employees, out of the 58 men in the workings at the time of the explosion only two had their equipment with them. Neither of these men was injured by the direct force of the blast. The body of one was found by the rescuers when they penetrated the affected workings. To all appearances he had made no attempt to fit, adjust or use his equipment and met his death from the effects of the afterdamp from which his self-rescuer was designed to protect him. The second man donned his equipment immediately after the explosion, walked out of the mine unaided and in safety and lives to tell the tale. This same piece of equipment was used by another man in recovery work immediately afterward.

In time of emergency and disaster men live under tremendous nervous strain and excitement reigns. Making all due allowances, however, for excitement and panic—for some men are sure to keep their heads just as some are sure to get rattled and confused—it would seem only the part of wisdom for mining companies to provide their employees with self-rescuers. It would also seem only wise on the part of the men themselves to learn the use of the equipment thus furnished and to carry it at all times when within the mines. No matter how careful a mine owner may be in the matter of precaution against possible danger it all goes for naught if those for whom the precaution is taken are unable or unwilling to do their share toward their own protection.

Electric Lamps and Efficient Illumination

SINCE JULY 1, 1924, mine regulations established by the Industrial Commission of Utah have made the use of electric lamps obligatory in Utah mines. Mine operators have complied with this regulation and electric lamps are in general use. Approved safety lamps, magnetically locked and equipped with igniters are in use for testing purposes. In Wyoming electric lamps are extensively used by the larger companies. As in the neighboring state safety lamps are also used for testing purposes. It would thus appear that the electric lamp is now widely used in Western coal mines.

Naturally there are differences of opinion arising from the fact that the electric lamp is neither an indicator of gas nor of bad air. The flame safety lamp of modern construction is safe when properly handled and is the simplest device for detecting and estimating approximate proportions of methane in air. It has the disadvantage of yielding less light than the electric lamp. From the standpoint of efficient lighting and freedom from possible ignition the advantage lies with the electric lamp. Better illumination is an important factor in reducing the number of accidents.

Apparently no one method of lighting will satisfy all conditions but the major condition of better illumination now appears to outweigh the merits of the safety lamp except where gas is prevalent. If ventilation is thoroughly handled and adequate inspection maintained it would appear that where the mine is gaseous the electric lamp has important advantages such as reduction in eye strain, better direction of light and more light. Auxiliary lighting of working faces by flood lights and similar devices will be further developed and will establish better lighting conditions resulting in higher labor out-turn with fewer accidents. It would thus appear that there is here an active field for technical endeavor and the problem of underground lighting is not completely solved but like other coal mine problems is correlated with important considerations that need consistent research for their better understanding.

Illinois Entry Methods

WHY THE MINES in other sections of the United States with four-entry systems have not taken more kindly to Illinois methods has always been inexplicable because it seems an excellent way of meeting with the principal difficulties of heading driving. One feature that stands out prominently is the practice of putting the entries as near the center of the pillar as possible so that the duty of resisting the weight of the adjacent workings shall fall on solid coal unweakened by any openings. This in itself makes the pillar more efficient and reduces the strain over the headings.

Another feature is that the four headings are driven originally as two separate double entries, each entry extended as if the other did not exist. Each double entry has an intake airway and a return with crosscuts between them. Every 500 ft. or so airways are driven between the two double entries, and then all stoppings in both entries are ripped out and the ventilation system of the finished section is revised.

One pair of double entries is made the intake, the other pair is made the return. The air goes up one pair of entries and returns by the other pair, and between these two pairs is a solid pillar without crosscuts and therefore without stoppings. Consequently only every 500 ft. are these needed. This prevents a waste of air such as is likely to occur at the best of stoppings. It also reduces the number of crosscuts

where these have to be made at a certain specified distance from each other.

Reducing the number of crosscuts lowers the cost of crosscut driving and of building temporary and permanent stoppings and keeps the pillar more nearly intact. The plan also allows air to pass around standing cars or a fall though not of course unimpeded, for the parallel entry though open resists the flow of air with its own normal flow.

Much may be said, however, in favor of carrying the Illinois plan one step further in making the two double entries distinct without piercing the center pillar but varying from it by maintaining one of the headings of each double entry as an intake and the other as a return. In this way the mine is cut squarely in two and trouble in one half is not communicated to the other, but in that case all the stoppings in each double entry would have to be made of a permanent character and maintained in condition.

The almost unbroken center pillar of Illinois and the wholly unbroken pillar just outlined have certainly great advantages and may well be considered when laying out a mine or extending it. Piercing the central pillar every fifty or one hundred feet serves hardly any useful purpose. It certainly does not help ventilation in the outer headings, but it does simplify the gathering of coal from the entries and the shifting of machines from entry to entry. It surely is not worth while to construct crosscuts for any such a fleeting purpose as gathering.

Technicalities and Realities

OHIO OPERATORS have been no more successful in their efforts to persuade the United Mine Workers to consider a friendly readjustment of wages than the producers who preceded them in that vain undertaking. The recent correspondence between the Buckeye mine owners and Lee Hall, president of District No. 6 of the United Mine Workers, shows the union still refusing even to discuss the question of a wage revision with the employers. Outwardly at least, the determination to persist in the policy of inaction dramatized in Mr. Lewis' "no backward step" is as strong as ever.

That the Lewis policy of immovability is slowly wrecking the organization which only a few years ago dominated labor relations in the bituminous coal fields of the United States apparently means less to the present leaders of the union than the empty satisfaction which adherence to that policy may bring. That that policy is driving many of the union's former staunch supporters among the operators to desperate expedients for self-preservation provokes only vituperation from Indianapolis. Like the British miners' leaders with their "not a penny off, not a minute more," the United Mine Workers is sharpening the tragedy of unemployment in the organized fields by a blind devotion to a vainglorious slogan.

Nevertheless, the steady pressure of grisly economic facts is not without its effect. Although Mr. Hall echoes Mr. Lewis in the latter's obstinate stand, more and more the union leaders are forced to seek refuge in technicalities. Mr. Hall's first reply to the invitation of the Ohio producers to meet them in joint conference for the purpose of revising the present wage structure was a puerile evasion of the issue. The provision in the Jacksonville agreement calling for a conference at Miami next February, cited by Mr. Hall, is no bar to a revision of the existing contract at any time. If proof of this were needed, it was furnished in the answer of the operators wherein they recalled to Mr. Hall's convenient memory the number of times the 1917 and 1920 contracts were modified at the request of the miners.

These modifications, Mr. Lewis will retort, were the voluntary acts of the operators and established revision on the basis of mutual consent. This mutual consent the miners now decline to make possible. Mr. Hall, harder pressed in his defense of an untenable position, stresses the economic compulsion which made the operators pliant in other years. But economic compulsion is just as strong today: the only difference is in the direction in which it is exerted. In the revision of the 1917 and 1920 agreements, the operators both recognized and acted upon the existence of this economic pressure. Today the leaders of the United Mine Workers are endeavoring to use technicalities as blinders.

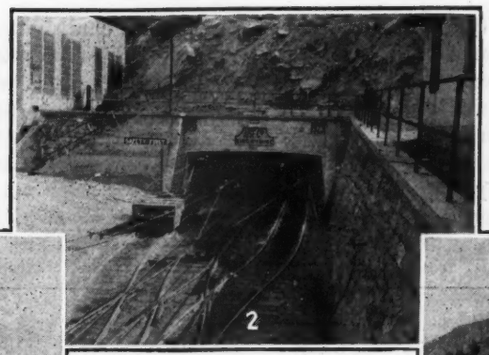
Steam Power and Hydro-Electric Power

ALTHOUGH in a broad way the economics of power production determine whether a steam power plant or a hydro-electric installation should be used, there are certain facts about each method of power production that require statement and thorough understanding. It is customary in hydro-electric development to raise money by stock or bond issues. This capital is spent in a relatively short time and for labor, materials and machinery. Thereafter the annual capital outgo is split into two disproportionate parts, one which goes to operation and maintenance and the other which pays interest and funding charges. The former is usually smaller than the latter. The latter rewards earned capital invested in the enterprise. There is for the amount of capital involved only a small annual distribution to productive labor spent in trade and for supplies.

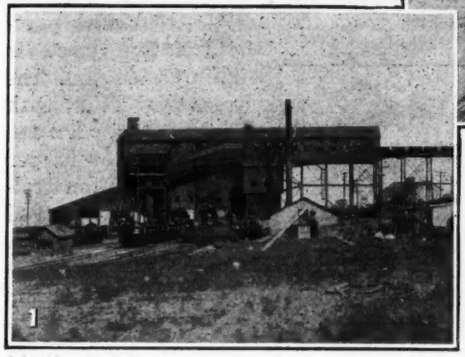
In contrast to this, the steam power plant usually involves a somewhat smaller capital investment, and its operating costs are therefore divided on a more equal basis. A considerable portion of its annual income is distributed over a wider area. Either solid or liquid fuel must be provided, and this involves an annual capital distribution to the mines and to the railroads. Labor gets a larger, and earned capital invested a smaller cut than in the case of the hydro-electric installation. Viewed broadly, the steam power plant is a more important factor in contributing to the prosperity of a community and the mining area supplying the fuel than the hydro-electric plant. It releases more money in trade and employs more men.

It will be granted that certain hydro-electric development is essential for economic reasons and that power costs are sometimes substantially lowered over the corresponding costs for fuel-produced power, but such development has in general reached its peak. Furthermore, steam-power costs have been substantially decreased by the use of pulverized coal, higher boiler pressures and more efficient prime movers. To take full advantage of the recent progress made in steam engineering it is essential to bring the attention of the coal miner and his co-partner, the railroad company, to the possibilities of cheaper fuel for large-scale power production. Both mining and transportation costs can be scaled down if demand can be built up constructively. Recognition of these facts will mean more mining, more transportation and a greater degree of prosperity in mining centers and for the carriers.

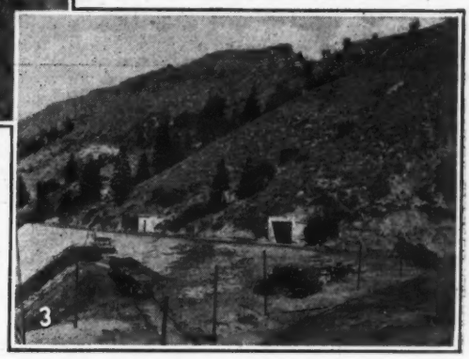
Below: Tipple at King Mine, Hiawatha, Utah, equipped with shaker and vibrating screens. Trestle connects tipple with 5,800-ft. gravity plane. Tipple is located 7,200 ft above sea level with the mine at 7,800 ft.



Below: Small magazine for blasting caps on left and larger one for current supplies of explosives on right. A large magazine for the main supply of explosives is around the point of the ridge, along the tramway.



Above: Portal to King Mine constructed of reinforced concrete. Hoist building on left and mine buildings on right. Mine opened in 1910 and portal rebuilt in 1923.



King Mine at Hiawatha Is Ripping Top Coal and Removing Its Old Pillars

Mine Divided Into Four Sections, Each Protected by Rock-Dust Barriers —High Percentage of Incombustible Dust Maintained in Entries—Little Gas but No Open Lights—Systematic Methods Save Most of 22-Ft. Seam

By George J. Young
Associate Editor, *Coal Age*, San Francisco, Cal.

THE UNITED STATES Fuel Co., affiliated with the U. S. Smelting, Refining & Mining Co., operates the King No. 1 and Hiawatha mines at Hiawatha, Utah, the King No. 2 mine at Mohrland and the Panther mine at Heiner, Utah. King mine No. 1 and King mine No. 2 are contiguous (Fig. 1) and virtually one operation for the same bed of coal is worked from two different openings in such a manner as to bring adjoining workings within 200 ft. of each other.

All the mines are served by the Utah Ry. connecting with the Denver & Rio Grande and the Union Pacific systems at Provo. A non-coking coal is mined and supplied to the general market which includes Utah, six intermountain states and the Pacific Coast states. The market extends from Los Angeles to Seattle and from Salt Lake City to Butte, Mont.

The King No. 1 mine is in the scarp of the Wasatch Plateau fronting Castle Valley, the Mesa Verde seam which is mined dipping into the mountain at an average grade of 3 per cent. Erosion has cut deep indentations into the face of the scarp making the working areas of the east side of the mine irregular. The coal has been destroyed by oxidation at the outcrop for distances which vary from place to place.

Occasional areas occur within the seam where the coal has been removed by previous erosion. Faults are rarely found and, in general, gas is not present, though no open lights are used. The seam has a working thickness of 22 ft. and the coal is massive, hard, and less brittle than most Utah beds, but in common with other Utah coals produces a dangerous dust. More or less pitch is an accessory constituent of the coal, which is comparatively free from sulphur.

Hiawatha is at an elevation of 7,200 ft., the mine drift being 600 ft. higher, that is, at an altitude of 7,800 ft. The tipple at Hiawatha is connected by a steel trestle with a gravity incline 5,800 ft. long, the steepest grade of which is 20 per cent. The tram is served by a gravity-plane hoist equipped for regenerative braking. Two main vertical sheaves receive four turns of the rope. Each main sheave is equipped with brakes on both sides operated by compressed air. These are used only in emergencies.

Generator Operates Automatically

As the downward trip reaches a certain speed, contactors automatically throw the generator into action, and as the trip is slowed down the generator is thrown out. A 1½-in. steel rope is used, and 68 tons of coal is lowered per trip. The steel roller-bearing cars weigh empty 3,300 lb. and are loaded with from 3½ to 5½ tons per car. A trip is lowered in about 4 min. and received upon the incoming track on the trestle where a rope haul advances the cars to the revolvng dump as they are needed. The empties are returned by a kick-back and automatic haul to the return track and are advanced to the hooking-on position by a cable haul. Some forty-one trips are handled in an 8-hr. shift. It is of interest to note that the present cable has handled 500,000 tons to date. The best previous record of a rope was 450,000 tons and usually 350,000 tons represents the service life of a rope. In addition to the main hoisting unit a single-drum, motor-driven hoist is available for use when trips large enough for the bigger unit cannot be furnished.

The tipple is of steel and equipped with inclined

shaker and revolving screens, picking tables, and a crusher and with equipment for loading on six tracks. A box-car loader for lump coal serves one track, two additional tracks receiving California lump, large lump and 8-in. run-of-mine. The remaining three tracks are for nut, egg coal, stove coal, slack and dust respectively. All machinery is electrically operated.

All the hoisting equipment is placed in a steel building at the head of the gravity plane and close to the portal of the haulage drift. Manganese-steel lined sheaves guide the hoisting ropes to the hooking-on points. Two motor-generator sets, one 520 and the other 750 hp., supply direct current for trolley and machine service. These are in the hoist house. No alternating current is used underground.

Explosives and blasting supplies are stored in three magazines in a protected but easily accessible place on a level with the portal of the drift. One magazine is the main storage for explosives, a second holds the floating supply and a third the blasting caps. Lamp room and mine offices are compactly grouped near the mine entrance. No open lights are used, storage-battery lamps being provided for all miners and underground men. All who enter the mine are given numbered metal checks which correspond to numbers and pins upon a board. This board contains under each number the name, home address and working place of the miner assigned to the number. As he goes off shift, the check is surrendered and placed upon its proper pin. Thus the system affords a convenient record of the ins and outs.

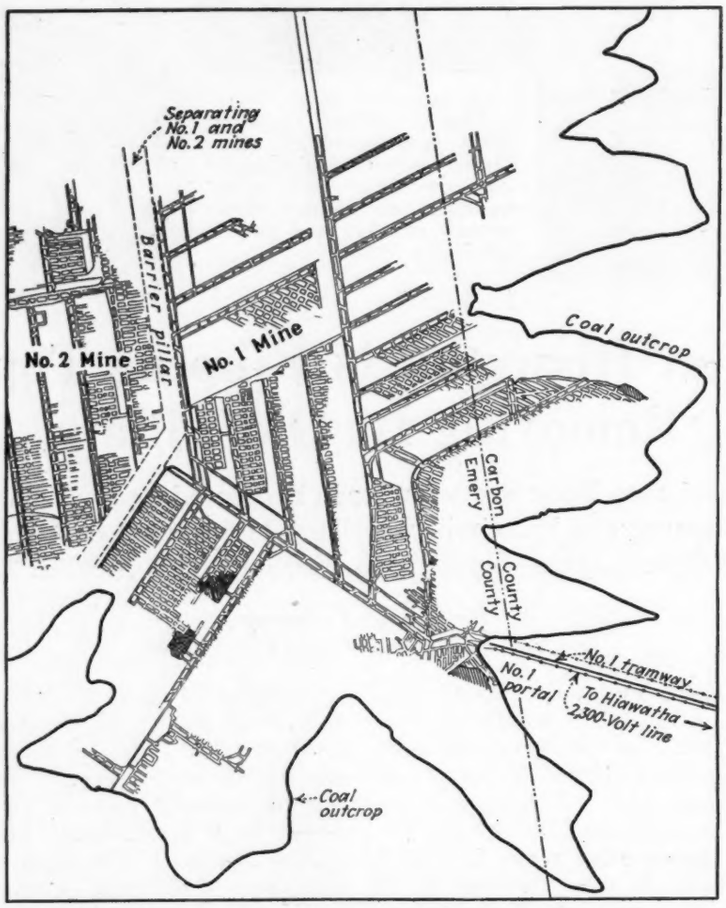


Fig. 1—King Mine of United States Fuel Co., Hiawatha, Utah

A carefully systematized method of operation, simple and conservative, has been used in laying out the workings. The rooms were driven only 22 ft. wide and the pillars in the rooms were 53 ft. wide. Only half the coal was taken in the rooms. It was, therefore, in good condition for the removal of the pillars and top coal, and a large percentage of both is now being recovered. This is being done systematically with excellent results. One of the dangers in this mine is the presence of pitch, or rosin, that pulverizes readily and adds to the dangers of operation. Recognizing this, unusual precaution is taken in watering at the face, in having dustproof cars that are dumped on a revolving dump and in using rock dust liberally both along the roadways and as barriers. A larger barrier pillar, left for safety, keeps any explosions or fires that might occur in No. 1 from being communicated from No. 2.

A 16-ft. exhaust fan, driven by a 150-hp. variable-speed motor, is provided for the ventilation of the mine, the main haulage adit and manways being intakes. Because of the generously proportioned airways the mine resistance is low, the water-gage being 1.1 in. A recording water gage and recording wet- and dry-bulb thermometers give a continuous record of the major conditions affecting ventilation.

The mine is operated on the double-entry room-and-pillar panel system. Entries are 7½ ft. high and 12 ft. wide; the chain pillars are 50 ft. wide. The rooms are spaced at 75-ft. centers and where driven on the upgrade which averages 3 per cent are at right angles to the entries and where on the downgrade are at a sufficient angle to the entry to reduce the room grade against the loads. Rooms are 22 ft. wide by 400 ft. long and a 100-ft. barrier pillar is left between the last crosscut and the back entry beyond the room.

The main haulage roads have single track with partings. The gage is 42-in. wide and the track is laid with 60-lb. rail. Room rails weigh 30 lb. per yard. A 15-ton trolley locomotive is used on the main haulage. Gathering service is provided by four storage-battery locomotives and three reel-type motors. In addition, a 3-ton locomotive is available for miscellaneous use.

Crosscuts in rooms are at 50-ft. centers and are staggered, the first crosscut being placed 100 ft. from the entry. Stoppings are constructed of concrete, one foot in thickness. Every third stopping is provided with an explosion door. Overcasts are arched and constructed of concrete with curved steel-rail reinforcement. Explosion doors are provided at the side of each overcast, each consisting of a metal plate hinged at the top and made tight by rubber belting on the inner edges.

The mine is divided into four sections each of which is isolated by nine dust barriers of both the V-box type and the special type recommended by the U. S. Bureau of Mines. Main haulage and entries are rock-dusted, and analyses are made at intervals. Whenever the proportion of rock dust falls below 71 per cent as shown by samples which are collected frequently, the entries are again rock-dusted.

A portable rock-dusting machine consisting of a feed hopper, a worm feed, a motor-driven fan and a fish-tail nozzle is used in this service. Ground gypsum and also limestone have given good results in the mine. All rooms are provided with water pipe and 125 ft. of hose. A liberal use of water is required at all operating faces. As a consequence there is no coal dust in suspension. Tight cars minimize the distribution of coal on the

entries and haulageways. All cars are loaded by hand and are therefore given a heavy top load. Excellent track maintenance makes this a practical expedient.

Shortwall machines are used for undercutting the coal. Each averages on 8-hours' work per day from 6,000 to 7,000 tons per month. The entries are undercut 12 ft. wide and blasted with four shots, two corner holes and two holes in the center line of the heading, one upper and one lower. The lower center hole is provided with an instantaneous electric blasting cap, the upper center hole with a 2-sec. delay and the corners with 4-sec. delay blasting caps.

Rooms are undercut 22 ft. wide and the coal is broken down to a height of 11 ft. by five holes, two at the corners, one in the center line near the line of the proposed coal roof and two lower holes. The lower or initial breaking holes are charged with primers carrying instantaneous electric blasting caps, the upper center hole with a 2-sec. delay cap and the corners with 4-sec. delay blasting caps. All holes are tamped with rock dust.

A separate circuit is maintained for firing shots. At the mine entrance a plug switch is interposed between the firing circuit and the master switch box. Each district is provided also with a separate switch. The plug switch gives a 7-ft. gap which is designed to protect the firing line from lightning and stray currents. A 440-volt alternating-current is used on the firing circuit. Permissible explosive is used for this blasting.

Most of the present mining consists in the removal of pillars. The mine for many years had been developed without the withdrawal of pillar coal and now systematic pillaring has been started in several places. Rooms were worked to a height of 11 ft. leaving 11 ft. of top coal and a 53-ft. pillar. The pillars are drawn on the inby side of each room. The first step is to strip the top coal out of the room up to the roof starting from a point near the entry. At the end of the room a face is driven at right angles to the room length across the end of the pillar. This crosscut is advanced by successive undercuts, the several vertical slices being shot down to the full height until a point is reached within 3 ft. of the cave in the contiguous room.

The top, a thick bedded sandstone, is supported by 21-ft. props carrying cap pieces 18 to 30 in. long. The props are wedged at the bottom and serve principally as indicators of roof pressure. From 7,000 to 25,000 ft. of prop timber is used per month, the ratio being about 500 ft. per 1,000 tons of coal. Probably this ratio will be increased as extraction proceeds farther back from the outcrop.

The crosscut across the end of the pillar or rather what will be the end of the pillar is made wider than the succeeding cuts as the roof is supported by the barrier pillar on one side and the room pillar on the other. The coal is loaded out by hand,

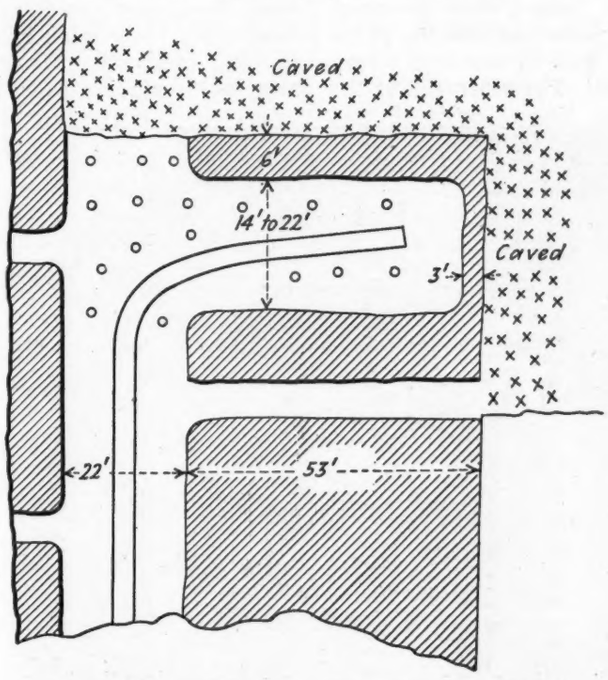


Fig. 2—Where Pillars Are Being Drawn in Rooms

The top coal has been removed in the room, and the pillars are being taken out. No work is done on the end of the pillar, a 6-ft. rib being left to hold back the cave. The caved material from the adjacent room is held back by a 3-ft. pillar. The rock falls in gigantic blocks. The props used, which are wedged at the bottom, are 21 ft. long and have cap pieces from 18 to 30 in. long. They are regarded rather as a means of indicating an impending fall than as protection against it.

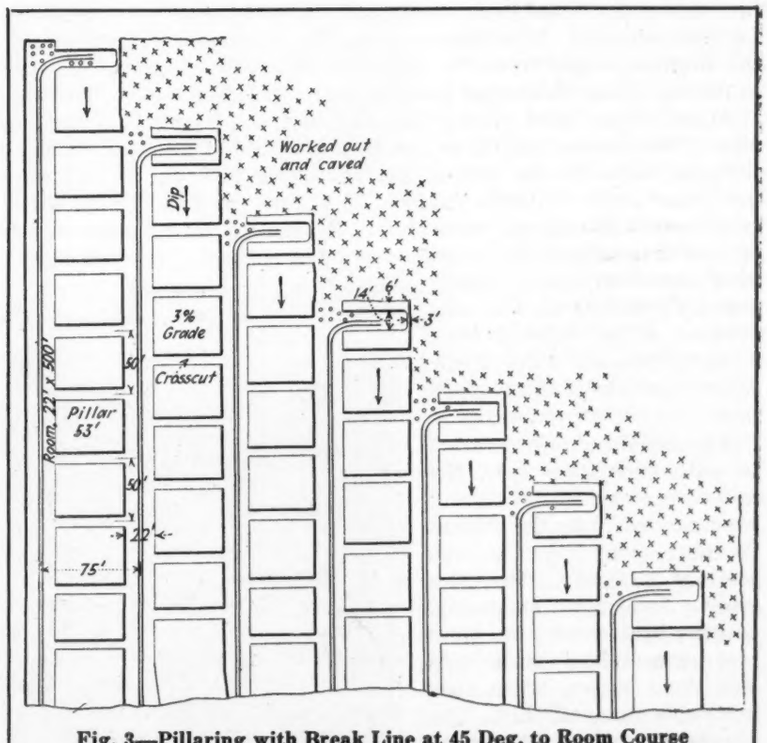


Fig. 3—Pillaring with Break Line at 45 Deg. to Room Course

With coal as thick as the aggregate height of three men, each abnormally tall and with a heavy cover the difficulties encountered by those who would draw pillars in such a seam are considerable. Realizing this the utmost care has always been taken to keep adequate pillars and to drive rooms of uniform width and unvaryingly straight alignment. Similar care is being taken in pillar extraction. As the pillars were made 53 ft. and the rooms 22 ft. wide and as a 100-ft. pillar separates the rooms in one heading from the back heading above, the areal extraction in first mining was roughly about 33 per cent and the actual extraction only about 16 per cent of the coal leaving 84 per cent of the coal to be brought back on second mining. However, not all that can be saved.

track being extended to the face. When the roof begins to work, the track is pulled up and the props pulled where possible. This is done by means of a long rope with a hook upon one end. The other end of the rope is tied to the prop, the hook attached to a locomotive and the prop hauled out.

On the succeeding cuts a 6-ft. end pillar separates the caved ground from the pillar face, as shown in Fig. 2. The width of pillar cut taken depends upon roof conditions. Props are placed at irregular intervals but are concentrated at the room end and near the center. End pillars are sliced and as much of the coal loaded out as possible. Contiguous pillar workings are 50 ft. in advance on the retreat so that a series of pillar workings falls approximately upon a 45-deg. line as shown in Fig. 3. Drilling is done from ladders. Hand drills are principally used, but a few power drills are also in use. The holes are normally from 6 to 8 ft. in depth.

Fig. 4—Manway Portal, King Mine

This, like the portal of the haulageway, is constructed of concrete. A bulletin board containing the monthly accident record by departments is placed close to the manway entrance.

It would appear that in a coal seam as thick as this one mechanical loading appliances would be used but they are not. Variable roof conditions are the reason for their absence. It is important that the miners hear the slightest sound from the roof, and it is impossible to do this when mechanical loaders are in operation.

About 50 per cent of the coal produced is of lump size. The average output at the face is 13 to 14 tons per man shift. Inside daymen average about 36.7 tons per man shift; outside daymen 31.8 tons, and all employees 7.28 tons per man shift. From 6 to 7 tons of coal is produced per pound of powder. About 190 men are employed underground and 100 men on the surface. The miners work from 7:30 to 3:30 and tipple operatives from 7:30 to 4:00 p.m.

At noon the shotfirers start in with detonators only, the necessary explosives having been carried in by the miners in fiber containers at the start of the shift. The company furnishes stemming. Miners load their own holes and connect lead wires with the firing system when they are ready to go off shift. The shotfirers assume charge at the end of the shift after all of the men are out. After blasting the mine is inspected and made safe for the loaders. Repair work on tracks and accessories is done on the dayshift. Mining is by piece work, the miners furnishing their own powder, drills and keeping up track work in rooms and timbering at the working face only. Motormen are paid $8.05; trackmen $8.15; nippers $8.00 and unclassified labor $7.80 per shift. The power ratio varies considerably with the working time and recently has ranged from 2½ kw.-hr. to as high as 9½ kw.-hr. per ton. A definite safety program has been prepared and its provisions are closely followed. The excellent mine discipline is obviously the result of careful and persistent safety work.

The various shops are concentrated in one building. The blacksmith shop is equipped with a bit sharpener, a rock-drill sharpener, a bulldozer for car-end bumpers, a metal press for bending car bodies, an air hammer, an air compressor, a combined shear and cutter, a drill press and a 40-in. cold-cutting saw for cutting rails. The machine shop has three lathes, a shaper, a planer, a pipe-and-bolt threading machine, grinding wheels, a gear cutter and an hydraulic press. There are also wood-working and electrical shops. Special equipment is provided for maintaining all scales in good working condition. A separate warehouse provides storage for spare parts and supplies. The value of the stock carried for all company mines is about $200,000, comprising in all some 10,000 items.

Hiawatha is a well-built, clean village housing a population of about 1,200. The company maintains stores, a hotel, an amusement hall and a club house and has built a special dormitory for the use of the school teachers. J. B. Forrester is general superintendent; C. N. Orr is mine superintendent, and William Burt mine foreman. The mine is a good example of the application of sound engineering principles and the development of a rational operating plan. It enjoys the obvious advantages of a thick seam with few irregularities and a low dip.

The mining community surrounding the operation is a good example of what can be accomplished in the way of town building under conditions that cannot be made altogether favorable from the artistic standpoint. Domestic environment unquestionably exerts a powerful influence on the well-being of the worker.

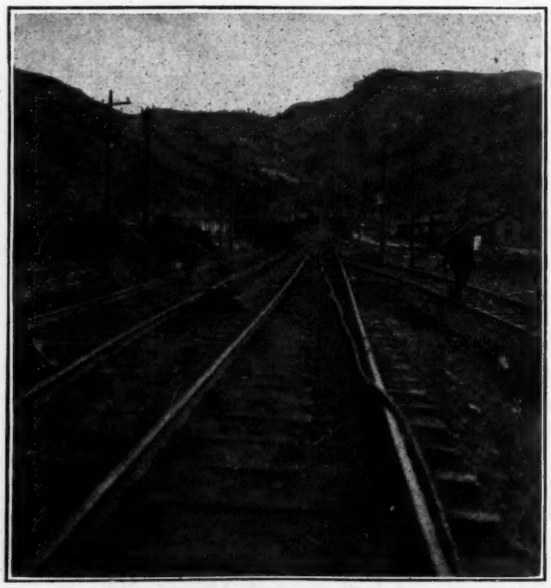


Fig. 5—Gravity Tramway Over a Mile Long

Connects tipple with mine. The gravity hoist is equipped for regenerative braking and has in addition brakes operated by compressed air for emergency use.

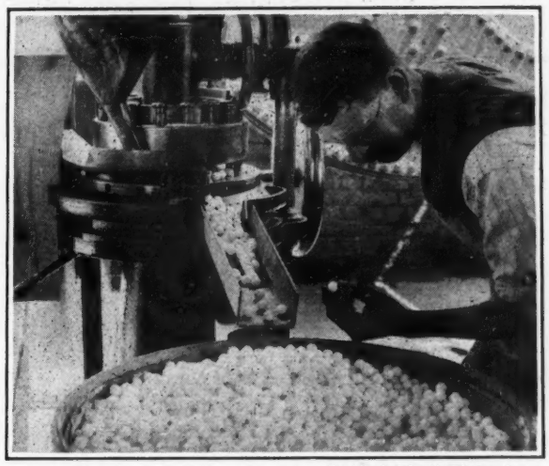
Will Any Greater Demand for Coal Develop Shortly?

More Economy in Use of Coal for Power Generation Likely—If It Is to Be Our Sole Source of Oil at Least 252 Million Tons Will Be Needed Annually — Little Hope Seen in Methanol and Fixed-Nitrogen Plants

By A. C. Fieldner
Chief Chemist, U. S. Bureau of Mines, Pittsburgh, Pa.

DEVELOPMENTS likely to influence the rate of consumption of coal may be grouped in three classes: (1) Centralization of the production of power; new and advantageous methods of utilizing coal and oil; (2) changes in the natural-gas and petroleum industries; (3) progress in the chemical industry, especially in the manufacture of synthetic chemicals from coal or coal products.

The small steam power plant at individual factories, except where exhaust steam is required for heating and processing purposes, is being replaced by electric motors operated on purchased power. In the ordinary boiler plant of a small factory the efficiency of furnace and boiler is seldom more than 50 to 60 per cent, which means that in many cases one-half or more of the heat of the coal escapes in the chimney gases, is lost in radiation or is wasted by incomplete combustion, the coal falling unconsumed into the ash pit. These losses, together with the investment costs, labor and time lost in repairs and firing up the furnace have led toward the centralization of power production. The average coal consumption of central electric stations for 1925 is about 2 lb. per kilowatt-hour as compared to 4 or 5 lb. for small factory power plants.



Pacific & Atlantic Photos, Inc.

Making Moth Balls from Coal in Britain

Flakes of naphthalene being pressed into small moth balls at Beckton, England, at the plant of the Gas Light & Coke Co.'s works. The naphthalene is condensed in a chamber, the flakes forming over walls, roof and floor to be shoveled up and pressed into balls large and small.

The progress in fuel economy of the large central stations has been tremendous. In 1913 the most efficient central electric stations produced a kilowatt-hour from 1¾ lb. of coal. Today the best record is a kilowatt-hour from 1 lb. of coal—a net saving in fuel of 40 per cent. The average consumption of coal per kilowatt-hour by public-utility power plants in the United States has steadily decreased from 3.2 in 1919 to 2.1 in 1925.

The best engineering talent of the country has been working intensively in increasing power-plant efficiency, in improving stoker and furnace designs, in developing powdered-coal combustion furnaces, in utilizing the waste heat of flue gases for preheating air and water, and in using higher temperatures and pressures. Also the efficiency of the steam turbine and condensing systems has been improved.

The average coal consumption of 2.1 lb. per kilowatt-hour for public utilities in 1925 is twice that of the most efficient station. Therefore, a continued decrease in the average unit consumption of public utilities may be expected for several years, as power stations are built and old ones modernized. This trend is now in full swing and it tends to decrease the rate of coal consumption.

The production of natural gas is declining, especially in the eastern half of the United States. The installation of manufactured-gas plants to augment the natural-gas supply is progressing and adding a small although not yet material increment to the rate of coal consumption.

Approximately 364 million bbl. of fuel oil were produced in 1925. Assuming that one ton of coal is equivalent to 4.2 bbl. of oil, this quantity of fuel oil has displaced 87 million tons of coal, which is 16 per cent of the 1923 production of 545 million tons. It is probable that the peak in the use of fuel oil has been reached, and a reduction may be expected in the near future. Fuel and gas oil have displaced coal because of three industrial developments: (1) The extraction of gasoline and lubricants which has left large quantities of residuum and crude oil suitable for steam raising, (2) the invention of the Diesel oil engine which has provided a new means of using oil for power purposes and (3) use of oil for marine boilers especially in the Navy.

The increased demand for gasoline and lubricants will soon force a decline in the use of fuel oil for railroads and power plant fuel and in the use of gas oil for gas enrichment, but increased use of the Diesel engine, especially for marine power, will work in the opposite direction and reduce the consumption of coal. But on the whole, the trend is toward the gradual replacement of fuel and gas oil by coal.

The proportion of petroleum converted to gasoline by cracking processes has been increasing each year. At the present time, 33 per cent of the total oil production is gasoline or becomes gasoline as a result of treatment and it is estimated that in ten years or so 75 per cent must be so obtained. Recent developments in cracking processes have made it possible to crack the heavy asphaltic oils heretofore available only for fuel oil. Gasoline yields of from 50 to over 60 per cent have been obtained. This gasoline has special anti-knock properties which make it more valuable than straight-run paraffin gasoline. These new developments in cracking are likely to raise the price of gas and fuel oils to a point where they cannot meet the competitive price of

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Abstract of address, entitled "Influence on Consumption of New Technical Developments and Conditions Likely to Alter the Rate of Consumption of Fuel," delivered before the International Economic Conference on Minerals, at the Institute of Politics, Williamstown, Mass. Published by permission of the Director of the Bureau of Mines.

coal. Thus, the consumption of coal will rapidly increase.

Researches on combustion in automotive engines which resulted in the discovery of tetra-ethyl lead and other anti-knock agents have changed the views formerly entertained as to the requirements for motor fuels. Formerly, the unsaturated compounds in gasoline were considered detrimental and were refined out by drastic treatment with sulphuric acid and alkalies. Now, it is recognized that unsaturated compounds such as olefines, the aromatic compounds such as benzol, toluol and xylol, as also the naphthenes, impart anti-knock properties to the gasoline permitting it to be used in high-compression engines with greater economy than may be obtained with ordinary gasoline.

The light oils from the distillation of coal in the high-temperature coking and gas-making processes consist almost entirely of aromatic compounds. Mixtures of coke-oven benzol and gasoline are excellent anti-knock fuels. The light oils made from the low-temperature distillation of coal are rich in olefines and likewise have excellent anti-knock properties. As soon as anti-knock fuels are generally available, the automotive industry will tend to increase the compression of engines. With high compression in general use, the demand for anti-knock constituents for blending with motor fuels will be stabilized and may possibly aid in a slightly greater use of coal for gas manufacturing and process purposes because the price paid for a gallon of light oil or benzol will be greater than the gas company can obtain for it in vapor form by selling it with gas. A gallon of benzol at 24c. on a heat-unit basis is equivalent to a 500 B.t.u. gas at $1 per thousand cubic feet.

Low-temperature carbonization is commonly regarded as a process that provides a smokeless domestic fuel and from 20 to 30 gal. of tar oil per ton of coal. Many experiments are being made both in the United States and abroad in the technical development of low-temperature processes. None of them are yet in commercial operation although a few are approaching technical and economic success.

At the present time low-temperature tar commands a price of 4 to 5c. a gallon. This is governed by the price of fuel oil. When the fuel-oil supply from petroleum becomes inadequate, then the price paid for fuel-oil substitutes may become high enough to make low-temperature carbonization profitable. Ultimately all the fuel-oil and gas-oil consumption must be replaced by coal. This replacement and the automotive fuel requirement seem to offer the most outstanding possibility of a material increase in the rate of coal consumption. Neither can be expected to take place soon.

Neither low- nor high-temperature carbonization can supply any great and sudden increase in demand for automotive fuel because in these processes the liquid fuel is a byproduct from the production of solid fuel. Therefore, any large increase in demand for motor fuel from coal requires a process in which motor fuel is the main product. Recent technical developments in Germany have shown two routes of fairly complete conversion from coal to motor fuel—namely, the Bergius process for hydrogenation and liquefaction of coal and the processes of manufacturing synthetic alcohols and hydrocarbons from the constituents of water gas—carbon monoxide and hydrogen—the water gas being made from coal or coke.

FUEL OIL has displaced 87 million tons of coal annually, but if coal is to get back that business by being converted into oil by the Berguis process three times as much coal as 87 million tons would have to be used or about 50 per cent of our present bituminous production. As far as oil used for fuel is concerned, conversion of coal into oil would not be needed, and we may yet be able to use coal dust in place of gasoline in an internal-combustion engine. Into such possibilities Mr. Fieldner does not enter.

In the Bergius process, one ton of crude oil is obtained from 2 to 3 tons of coal. The pulverized coal mixed with oil or tar forming a thick paste, is heated at 400 to 450 deg. C. in an atmosphere of hydrogen under a pressure of 150 to 200 atmospheres. The crude oils, after separation from the ash and undecomposed residue, on distillation and refining yield about 40 gal. of motor fuel, 50 gal. of Diesel-engine oil, 35 gal. of fuel oil, a pitch residue and 10,000 to 12,000 cu.ft. of high-B.t.u. gas per ton of coal.

A number of practical difficulties have yet to be solved before the Bergius process can be applied commercially and it is questionable whether it or the distillation of the richer oil shales will prove most economical during the early stages of the period of diminution of the petroleum supply. In any event the increased consumption of coal would be gradual. Some idea of the total quantity of coal that would be required to furnish petroleum substitutes can be obtained by calculating the coal required for the 1925 production of 755,852,000 bbl. of petroleum. Assuming Bergius' lower figure, that of 2 tons of coal for one ton of crude oil—corresponding to 6 barrels of crude oil per ton of coal—the coal requirement would be 252 million tons. In other words, our present output of bituminous coal would need to be increased about 50 per cent to supply also the crude oil now produced. No doubt our friends in the coal business would welcome the exhaustion of our petroleum resources. It would solve the immediate troubles of the coal-mining industry.

ENTHUSIASTS acclaim methanol and fixed-nitrogen plants as possible large users of coal, but the consumption of these products is so low that Mr. Fieldner is not greatly impressed. The synthetic-ammonia plants will use next year about 10,000 tons of coal directly in the manufacture of ammonia and the methanol plants would supply all of that liquid we need from 75,000 tons. However, methanol could be used as a motor fuel and the demand for ammonia may be expected to increase with more enlightened agricultured methods than now obtain.

The second route from coal to motor fuel is complete gasification by the production of water gas and hydrogen. A commercial process has been developed by the Badische Anilin and Soda-Fabrik in Germany for the manufacture of methanol (pure wood alcohol) by compressing one volume of carbon monoxide and two

volumes of hydrogen at a pressure of 150 to 200 atmospheres and a temperature of 300 to 425 deg. C. in a copper-lined reaction chamber containing one or more of a number of catalytic materials. According to various reports, fairly pure methanol is produced under these conditions at a manufacturing cost of from 18 to 27c. per gallon. Methanol can be used as a motor fuel.

A similar process has been developed by Franz Fischer, of the Coal Research Institute at Mülheim in which other catalytic materials are used which result in a liquid fuel termed "synthol" by Fischer. This is a complex mixture of various alcohols, aldehydes, organic acids and hydrocarbons. The process has not gone beyond the laboratory stage and the best yields thus far obtained have been about 27 per cent of the gases entering the reaction chamber. More recently Fischer has reported the conversion of carbon monoxide and hydrogen into hydrocarbons of the methane series at atmospheric pressure and at a temperature of 270 deg. C. The reaction is induced either by the catalytic effect of finely divided metals alone, or of such metals mixed with oxides such as those of zinc and chromium. In one experiment a 14 per cent yield of liquid hydrocarbons similar to gasoline was obtained from one cubic foot of water gas.

No Immediate Results Expected

These discoveries in the research laboratory are of the highest importance and show that when the need arises it will be possible to make motor fuels from coal, but no appreciable effect on the rate of consumption of coal need be expected from this source in the immediate future.

The chemical industry uses a large quantity of coal for heating, processing and power purposes. It is not necessary to go into details regarding the proportions because of the indefinite boundary line between chemical and other industries. The features of particular interest in this connection are the new developments in the use of coal as a raw material for the manufacture of chemicals as, for example, synthetic ammonia, methanol, ethyl alcohol, and other solvent agents. Will these developments increase the consumption of coal to any material degree?

Consumption for Ammonia Insignificant

It is estimated that the synthetic ammonia plants in the United States completed by the end of 1926 will produce approximately 32,000 tons of NH_3 per year. From figures published by the Fixed Nitrogen Laboratory of the Department of Agriculture it may be estimated that approximately 3.3 tons of coal are consumed in the production of one ton of NH_3. Therefore, a total of $3.3 \times 32{,}000 = 105{,}600$ tons of coal will be consumed in the production of ammonia. This would be about 0.02 per cent of the annual bituminous coal production—quite an insignificant figure—and the prospects for a greatly increased production of synthetic ammonia in the United States are rather poor.

The DuPont plant at Belle, West Virginia, near Charleston, operating the Claude process has a water-gas plant of a capacity of 8 million cubic feet per day, bituminous coal being used for the production of water gas. The estimated plant capacity for ammonia is 25 tons per day. If the full water-gas capacity is needed for the 25 tons of ammonia per day and if 45,000 cu.ft. of water gas is produced per ton of coal, then a total of 7 tons of coal will be required per ton of ammonia. No matter which figure is used it will be seen that the coal consumption of the country will not be increased noticeably by fixed-nitrogen plants.

No figures are available on the coal required per unit of methanol. Furness,* estimating from Audibert's experimental data, states that approximately one million cubic feet of water gas would produce 2,500 gal. of methanol. Assuming 45,000 cu.ft. of water gas per ton of bituminous coal, 22 tons of coal would be required for this quantity of water gas and one million gallons of methanol would require 8,800 tons of bituminous coal. The 1923 consumption of methanol in the United States was about 8½ million gallons. This would have required 74,800 tons of coal—an insignificant figure in comparison to the total coal consumption.

Synthetic Gasoline Key to Situation

From the previous paragraphs referring to the outstanding developments in recent years in the synthesis of chemical compounds from coal or gas, it is apparent that their present consumption can have little influence on the total coal consumption. It is only through the substitution of these synthetic products for petroleum products used for motor fuel that any material change in coal consumption may be expected and this substitution is not likely to be made in the immediate future.

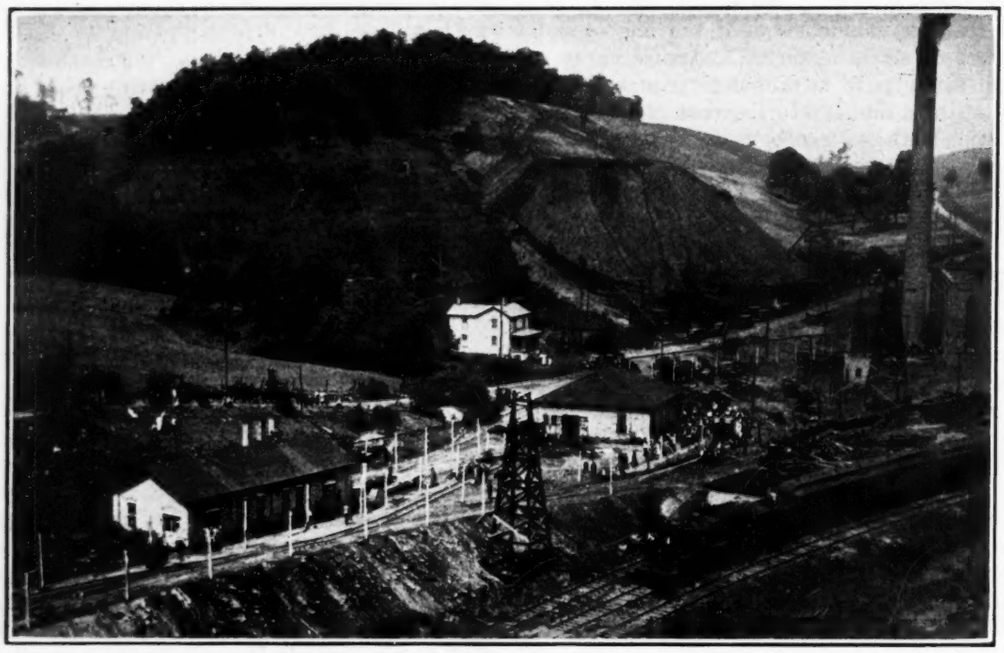
Centralization of, and new developments in, power production have caused a decreasing rate of coal consumption for power purposes for some years, and this influence is likely to continue for a time at least. On the other hand, the declining natural-gas production and the increasing demand for gasoline and lubricants will soon act in the opposite direction at an accelerating rate as petroleum needs replacement by coal. Developments in the chemical utilization of coal will not run into large tonnage figures before the day of synthetic gasoline.

*Furness, Max, Synthetic Motor Fuel, Industrial Chemists, Vol. 1, Nov., 1925, p. 475.

Boy Scouts Learn First Aid for Miners

These lads, who belong to a troop in Hazleton, Pa., are considered skilled in the use of bandages, tourniquets and the like. They are among the 360 Scouts who qualified in the United States during 1925 for the special merit badge in mining offered by the Boy Scouts of America. Besides learning a few of the rudiments about first-aid the boys who won the merit badge met these tests: (1) Identified and described twenty-five minerals; (2) Defined vein, placer, lode, stratum, dip, strike, joint, fault, and identified ten different kinds of rocks; (3) Stated what metals are mined from placer and in what general respects placer mining differs from lode or vein mining; (4) Described how mines are ventilated, and gave the conditions that differentiate coal mining from metal mining, and (5) Described systems for mine ventilation, safety devices, and rescue methods as taught by the American Red Cross Society.

Coal Fields of Eastern Africa—In the article on the coal fields of Africa in the issue of Aug. 19 the thickness of the individual coal seams in Abyssinia, Eritrea and British Somaliland is said not to exceed 2½ in. This should be 2½ ft.



Open-Type Motor Driving Blower Believed Ignition Agent in Clymer Mine Explosion

Blower Distributed Air to Face of a Stub Entry—A Crosscut Outby, Is Thought to Have Short-Circuited the Air—An Explosive Mixture Was Swept by the Blower Over Itself

AN OPEN-TYPE MOTOR driving a blower was the agent of ignition responsible for the explosion in the Clymer No. 1 mine of the Clearfield Bituminous Coal Corp. on Aug. 26, resulting in the loss of 44 lives, in the opinion of the commission of mine inspectors appointed to investigate the cause of the accident. Although this report was submitted as evidence before the coroner's jury that body declined to fix either cause of, or responsibility for, the accident definitely.

The particular blower unit in question was being used in a system of auxiliary ventilation in a blind entry under development. A locomotive, three hoists and two cutting machines were in the section in which the explosion originated, but all evidence pointed to the fact that none of this equipment was in operation at the time. Incidentally, the cutting machines used in this mine are of the government-approved type. All other equipment was operating in fresh air. Coal dust contributed to the explosion although the workings in the affected area were quite wet. Contrary to an earlier report, this mine was not rock-dusted.

These are the findings as brought out at the inquest over the bodies of those killed in the disaster. This inquest was held in Indiana, Pa., on Sept. 7, by Coroner Fred St. Clair under the guidance of Ira Thomas, state mine inspector of the 13th Bituminous District. A jury consisting of two mine operators, two miners and two

Headpiece shows the surface works at Clymer No. 1 mine where the explosion occurred. Aside from the people waiting about there is no sign of trouble. Property damage was almost negligible as no overcasts were blown out and few falls occurred. The fan was undamaged although the explosion doors protecting it were blown open. The month of the slope leading to the Lower Freeport bed, which is the measure here worked, may be seen directly beyond the railroad locomotive.

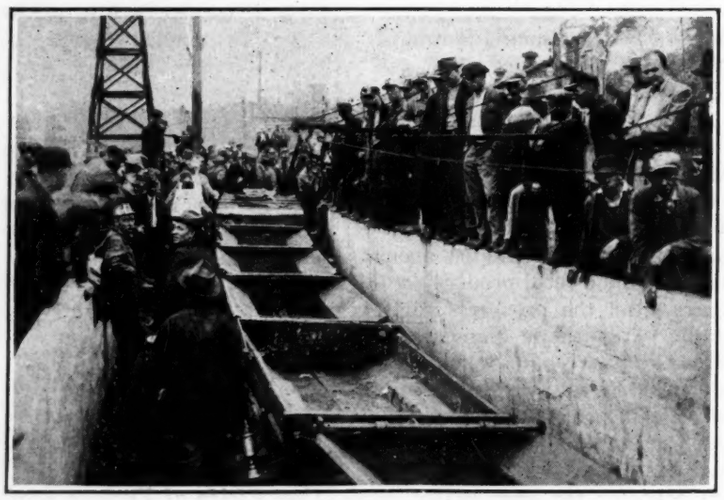


Fig. 1—Apparatus Men Going Off Duty

As this operation is readily accessible from other mines in its vicinity no less than 13 rescue teams including the Bureau of Mines car and corps were on the scene within three hours after the explosion. Oxygen breathing apparatus to the number of 55 sets was also avaailable. The rescue work was unusually rapid. Within 21 hr. after the blast the bodies of all but three of the victims had been recovered.

business men returned a verdict to the effect that the "deceased came to their deaths as a result of an explosion of gas" and that "the location of the point of ignition and the cause are unknown."

From April 16 until Dec. 17, 1925 this mine was not in operation. On the latter date work was resumed on a small scale, being confined almost exclusively to the development of entries. On the day of the explosion 62 men were at work in the mine most of whom were performing their respective duties in the working of the First North heading where the explosion took place. Of the 44 men who died, 27 were killed by the explosion directly and 17 died from the effects of afterdamp. Eighteen men escaped unharmed. Of these 14 came out of the mine unassisted and four were rescued. Normally this operation employs about 150 men.

Clymer No. 1 mine is a slope operation in the Lower Freeport bed. The main headings are driven in a northwesterly direction and are on a grade of about 3½ per cent inby, equivalent to the dip of the seam. The average thickness of the coal is 4 ft. The mine is laid out in a four-entry system and is ventilated by a reversible, double-inlet fan which operates exhausting and delivers about 90,000 cu.ft. of air per min. against a water gage of 1.8 in. This fan is located at the mouth of a 70-ft. shaft that connects with one of the return airways. The intake is through a shaft of the same depth which is connected with the manway of the main heading.

The lower workings gentrate gas and are under fairly heavy cover, the overburden in places attaining a thickness of as much as 350 ft. About five years ago the lower workings were put on electric cap-lamp operation and approximately two years later this practice was extended to all parts of the mine.

Fig. 2—Checking Out a Crew of Rescuers

Because ventilation in this mine was only slightly damaged by the explosion restoration of air circulation was quickly accomplished. Consequently those in charge soon determined that the use of electrically-hauled man-and-supply trips would be safe. These greatly facilitated recovery operations. Of course the electric current was not switched on until all due precautions to assure its safety had been taken.

At a distance of nearly a mile from the outside the main headings ran into a faulted area of considerable extent. This was avoided by driving in a northerly direction, these workings constituting the First North headings. It was in this section, where most of the men were working, that the explosion took place. At a distance of about 2,100 ft. from their intersection with the main entry the First North headings entered rock which persisted for a distance of about 100 ft. Only the haulway and the No. 2 airway had been driven through this barren region. On the inby side of this rock area the other two of the First North headings had been picked up and were being developed in coal.

The haulway only was driven forward continuously to its present point of advancement. Airway No. 1 was picked up beyond the fault from the first crosscut connecting No. 2 airway with the haulway. Airway No. 2 was being driven inby from this and outby from the next crosscut.

With only two of these entries driven through the rock area, ventilation of the advancing entry faces was limited to a single split, which, incidentally, ventilated the entire First North section. The intention was to ventilate this section by two splits of air after the four entries had been interconnected. To this end two overcasts were under construction to carry the air to the main returns.

The face of the haulway and that of No. 1 airway of the First North headings were being ventilated by line brattice but the blind No. 2 airway was being ventilated by a blower and tubing. The last crosscut, at *C* (see accompanying diagram), of course, was open, but inasmuch as the plan of working required shifting of cars from the haulway to the other two entries through crosscuts *A* and *B*, canvas curtains were hung in these passages. Trolley wire was hung in the haulway to a point about 15 ft. outby of crosscut *B*.

Apparently Two Explosions Occurred

In the shifting of cars on the haulway the gathering locomotives were always kept on the outby end of the trip. Empty and loaded cars were trammed by hand. Three small hoists, when necessary, assisted in this shifting. However, none of these machines was in operation at the time of the explosion.

G. W. Stear, a farmer who lives within view of the substation and fan, said that at about 1 p.m. on the day of the explosion he saw a strong puff of smoke and dust emerge from the fan housing. This was of sufficient force to raise the explosion doors. He claimed he saw a second puff shortly after the first.

Richard Minto, substation attendant, who also looks after several pumps underground, said that he was in the vicinity of the intake shaft bottom when the explosion occurred. When half way up the stairway of the intake shaft (which is about 70 ft. deep) he said he felt the force of a second explosion. Arriving on the surface he examined the fan and found it in operation. He was shown a water gage chart which he identified as the one made on Aug. 26. On this was an uncommon irregularity in the graph at the line for 1 P.M. which indicated that the explosion occurred at that time. The chart also showed that the fan did not cease operation.

E. S. Beechy, a certificated fireboss, said that he had not detected gas in any of the workings of the First North section on the day of the explosion. The fact was brought out that he spent only part of his time firebossing. An examination of the First North section would take him about two hours. He ordinarily made only one tour each day—in the morning—and worked the remainder of the day as a scraper with a cutting machine. The second fireboss tour of the day, he said, was made by Oscar G. Nelson, assistant mine foreman, who was killed in the explosion.

Mr. Beechy stated that upon various occasions he had detected gas at the faces of the First North headings. State Mine Inspector Thomas produced a record book of the mine which showed that Mr. Beechy's last report of gas detection was for July 26. Continuing his testimony, Mr. Beechy admitted that where line brattice

was used in the First North headings it was not always added to systematically, that is, in step with the advance of the face.

Curtains were hung in the second and third crosscuts outby of the face of the First North haulway, remarked Mr. Beechy. These served to conduct fresh air to the last crosscut. They were hung in such a fashion that they could be lifted while cars were being shifted through the passages in which they were installed.

When the explosion occurred Mr. Beechy was at work as a member of a cutting machine crew in a room in the Eight Right section. The first blast lasted 15 to 20 sec., he said, and was followed by a second blast shortly afterward. He encountered afterdamp in leaving the mine but managed to find his way out unassisted.

Night Boss Fred Hancock testified that the second and third crosscuts outby of the face of the First Right haulway were closed by a three-quarter check and a full curtain respectively. Cars were shifted through these crosscuts to airways Nos. 1 and 2. He had served one week prior to the explosion as night boss and during that time had detected no gas at the faces of the First Right headings although he examined these places once and sometimes twice during each shift.

Fred Slater, a miner, stated that he was working in the last room off the Second Left cross entry of the First North headings. He heard the explosion but did not stop work to investigate until after he had finished loading a car. On the manway of the main entry he met seven other men and together they traveled toward the mine exit. He left the mine through the intake shaft after having traveled over a mile, but the others emerged by way of the manway and slope after having traveled nearly two miles.

Here the fact should be mentioned that the miners on development work in these entries cut their own places. George Machany, miner and cutter, worked on the night shift. He was employed at the face of No. 2 airway on the night prior to the explosion and during that shift detected no gas.

As indicated on the accompanying sketch of the affected workings the blower which ventilated No. 2 airway was located on No. 1 airway, a few feet outby of the connecting crosscut between these two passages. Tubing extended from the blower to a point in No. 2 airway midway between the face and the crosscut.

Mr. Thomas apparently was under the impression that the tubing ended at the junction of this crosscut with this entry. However, Mr. Machany testified that he himself had added a 50-ft. section of tubing to the system on the night prior to the explosion. One 50-ft. section was already attached to the blower and this extended through the crosscut and a short distance into No. 2 airway. The section which he added advanced the end of the tubing to within about 50 ft. of the face. The blower, he claimed, furnished plenty of good air; but on being quizzed he remarked that it ran continuously except when the power failed which "wasn't often." He added that he had frequently heard hissing of gas but could not always detect it.

Joseph Staski who worked with Mr. Machany corroborated the statements of his "buddy" and said that the blower was running when they left the place on the morning of the explosion.

Gas was reported fairly regularly at the faces of the First North headings after the fault was struck, according to Jacob Frantz, mine foreman who had served in this capacity at this mine for about seven years. He said that his men made it a point to put the line brattice close to the face when gas was reported but admitted that it was not always kept as close as it should have been. He said that the blower ventilating the No. 2 airway ran continuously and was so wired as to start automatically upon resumption of current supply following a failure of power.

Mr. Thomas attempted to get Mr. Frantz to admit that the workers in this entry might have shut down the blower at various times because of the drafty condition which, the witness averred, it created. But Mr. Frantz was positive in his statements that he never saw, or heard of, this being done.

He then described the haulage arrangements in this section of the mine. Loads were trammed from the several working faces and made up into trips on the haulway. A gathering locomotive pulled each loaded trip out after which a trip of empties was pushed in on the haulway and then distributed by the men themselves to their several places. In these maneuvers the locomotive never left the haulway.

When shifting cars to and from airways Nos. 1 and 2 the canvas curtains in the second and third crosscuts outby of the face of the haulway were lifted. The last crosscut was broken through only two days prior to the explosion. He had figured on installing a door in the third crosscut. Another proposed plan, he said, was to divide the First North section into two splits after the ends of these headings had been interconnected.

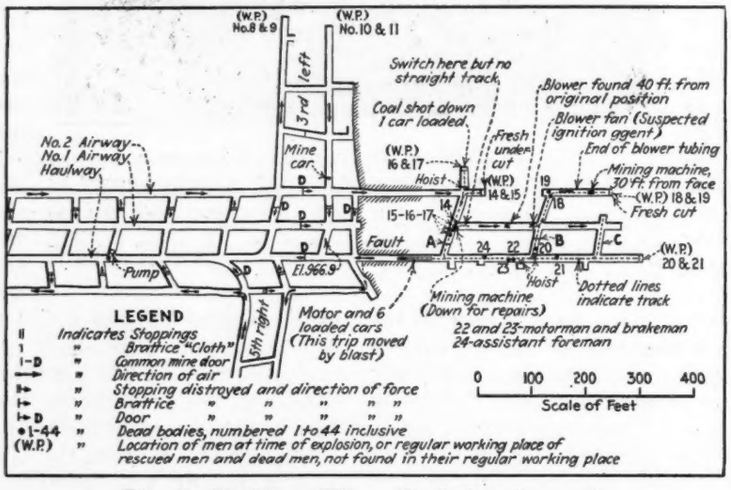


Fig. 3—Workings Where Explosion Occurred

To all appearances the explosion originated at the extremity of the First North headings. In passing through a fault only two entries were driven. From the lower of these, which is the haulway, the others were picked up and driven in both directions in coal. Air was directed to the last crosscut off the haulway by canvas curtains. These were lifted while cars were being shifted in these passages It is believed that the curtain in the third crosscut was raised allowing the air to short-circuit to the return. A stub entry in the projection of No. 2 airway was ventilated by a blower and tubing. With the air shortcircuited it is believed that this machine recirculated the same air to the face and back again continuously, with the result that gas issuing from the face, which was freshly undercut, was not swept away but was mingled with the air moving in a practically closed circuit until an explosive mixture was formed. An open-type of motor driving the blower ignited this mixture, according to the report of the state mine inspectors who investigated the accident.

Mr. Thomas wanted to know what was the system of ventilation while the haulway and No. 2 airway were being driven through the rock fault. Mr. Frantz brought out the fact that two blowers were utilized for this purpose. On being questioned further, he did not explain clearly exactly how No. 1 airway was ventilated while it was being driven a distance of about 150 ft. from the first crosscut inby of the fault to the second. Fireboss Beechy was recalled to the stand and answered this question. A blower and tubing were used in this work and his answer was verified by Mr. Machany who drove this entry.

At the time of the explosion Mr. Frantz was on the outside. On being informed of the trouble he immediately went into the mine, making two trips on a locomotive. On his first trip he traveled about half a mile into the mine and rescued one man who subsequently died. On his second trip he went as far as the junction of the main entry and the First North headings. There he found four men whom he assisted to the outside. In making these runs the trolley circuit was restored in steps from switch to switch. He was assisted in this rescue work by Mervin Sherrick, mine electrician, who happened to be on the outside in quest of a cutting machine part for repairs.

Fig. 4—Locomotive and Trip in Mine Entrance

Little property damage was done by this blast. Almost immediately after it occurred a locomotive was run into the mine for a distance of half a mile or more. The fact that the haulage system could be utilized in recovery work greatly simplified and facilitated these operations.

The question was asked as to how the blower was wired. Mine Foreman Frantz replied that insulated wire was attached to the end of the trolley wire on the haulway and was carried through the second crosscut to the blower. The wire was hung on the rib close to the roof. On a post directly behind the blower was installed an open-type switch which was provided with a fuse.

T. F. McCarthy, superintendent of equipment of the coal company, testified that the motor on the blower was a 1-hp. open-type unit and that the blower delivered about 1,200 cu.ft. of air per min. He testified that to the best of his knowledge no approved closed-type of motor suitable for the purpose was available.

Blower Apparently Churned the Air

Mr. McCarthy declined to admit that the blower was the probable cause of ignition in this explosion. He pointed out that the curtain in the third crosscut could have been raised, in which case the main current of air would have been short-circuited through this crosscut to the return. If this were the case the blower would probably have swept any accumulation of gas present back over and into itself.

Mr. McCarthy, however, would not admit the liklihood of this case. He claimed that no gas had been detected on that day and that the period during which normal circulation of air might have been disturbed could not have been sufficiently long to have allowed the formation of a dangerous mixture. The cut at the face of No. 2 airway, he pointed out, had been freshly made.

State Mine Inspector W. D. Wardrop of the 15th Bituminous District described conditions in the First North section as he found them while assisting in an investigation for the state. A locomotive attached to a trip of six loaded cars was standing in the haulway outby of the third crosscut. The motor was off the track and the brake on it was set. Marks on the roof which he believed had been made by the trolley wheel, seemed to indicate that the trip had been pushed outby for about 100 ft. by the force of the explosion. The track at this point was downgrade outby. Three empty cars were jammed against the hoist in the second crosscut. These evidently were in this passage and were being shifted at the time of the explosion. The blower was found about 40 ft. outby its original position. The cutting machine in the third crosscut was off the track and jammed against it inby was an empty mine car. He found two sections of canvas tubing, neither of which was attached to the blower.

Mr. Wardrop described in detail conditions in the No. 2 airway. This blind entry dipped inby from the second and only crosscut to the face. From the face to a point about 50 ft. outby the roof is lowered about 15 in. from normal entry height by an offset which consists of a sandstone parting above which is roof coal. The entry was being driven under this low roof. The face of this passage was found cut but not shot. The machine that undercut this place stood about 30 ft. from the face and apparently was being moved out when the explosion occurred. This machine is of the government-approved type and no defects were found on it.

The last witness called was Thomas Lowther, state mine inspector of the 25th Bituminous District. Operation of the Clymer No. 1 mine falls under his jurisdiction. On July 8 he made his last regular inspection of this mine and at that time found general underground conditions satisfactory. Mr. Lowther submitted the last of direct testimony by reading a report of the findings of a commission of state mine inspectors which was appointed by Chief J. J. Walsh to investigate the explosion. This commission consisted of Messrs. Lowther, Thomas and Wardrop.

The commission believes that the agent of ignition was the open-type motor on the blower which was used to ventilate the No. 2 airway. It is of the opinion that circulation of air to the last crosscut was disturbed, assuming that the canvas brattice in the third crosscut outby of the face of the haulway had been raised, which thus caused the air to be short-circuited through this crosscut to the return. This condition, the commission reasons, caused an accumulation of gas in the No. 2 airway which was diffused until an explosive

mixture had been formed. This mixture is thought to have been swept out to the blower where it was ignited by the open motor. The commission further is of the belief that the local explosion of gas caused coal dust to be suspended in the air and to contribute to the explosion.

Manifestation of extreme heat in the No. 2 airway and of considerable force in the crosscuts led directly to this locality as the seat of the explosion. Three sets of entries are turned off each side of the First North headings. The effects of considerable violence were in evidence in these entries. The force of the explosion was pretty well expended when it reached the outby end of the First North headings.

As a result of this investigation the commission recommends that the use of blowers in a system of auxiliary ventilation be confined to those mines or sections of a mine where gas is not generated. It also recommends that well-constructed line brattices be used in the ventilation of all stub working places where gas is emitted. Its third recommendation is that dry coal dust be rendered harmless by rock dust, sprinkling with water or by any other efficient means.

Perforated Plates Prevent Emission of Flame

Plates Cool by Conduction and Expansion—With Thin Plates Area of a Single Hole Is More Important than Total Area of all Perforations

Detailed information regarding the passage of the flame of an explosion through perforated plates are presented in Paper No. 21 of the Safety in Mines Research Board of Great Britain, entitled "Flameproof Electrical Apparatus for Use in Coal Mines." The authors are C. S. W. Grice and R. V. Wheeler. Among the conclusions are the following:

Burnt and burning gases may be cooled on their passage through perforated plates in either of two ways, by their rapid expansion or by their contact with cold metal surfaces. If the total area of the perforation in the plate is small, the expansion effect may be held to be responsible for most of the cooling. If the perforations are numerous so that the total open area is great, cooling by conduction will predominate.

COOLING BY EXPANSION ALONE INSUFFICIENT

In experiments with brass plates having either single holes or a number of symmetrically spaced perforations, it was found that, unless the plate was at least ½ in. thick, cooling mainly by expansion of the gases was unable to afford safety and at the same time give adequate release of pressure. If, however, the plates were ½-in. thick, the open area could be increased and the release of pressure thus accelerated, for the perforations acted as so many tubes presenting much cooling surface to the hot gases.

Of all mixtures of methane and air the flame from a mixture containing between 9.5 and 10 per cent of methane is the most difficult to stop. The most dangerous position for the point of ignition is near the perforated plate when this is of small area and at the center of the inclosure when the area of the perforated plate is large.

The area of each perforation is, in general, of more importance than the total open area of the plate, more particularly with respect to thin plates (⅛ in. thick or less). As the thickness of the plate is increased the effect of the size of the perforations is decreased.

The area of aperture in an inclosure covered by a perforated plate required to combine safety with adequate release of pressure is ¾ sq. in. per liter of explosive mixture within the inclosure. One square inch per liter or approximately 28 sq.in. per cubic foot can be taken as providing ample margin of safety.

As a result of the tests the following specifications can be given for specially perforated plates with uniformly spaced perforations, any one of which affords satisfactory protection against the passage of flame of the most explosive mixture of methane and air.

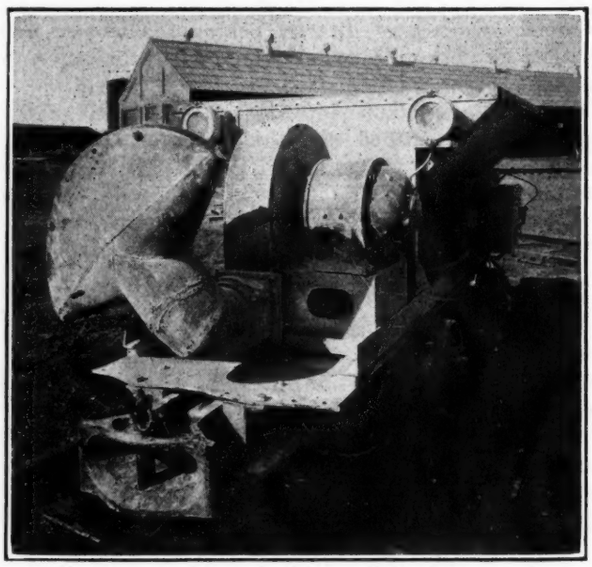
Plate Thicknesses That Will Afford Protection

(Against most explosive firedamp mixture; all holes 1/16-in. diameter)

Plate Thickness, In.	Number of Holes, In.	Total Open Area per Plate, Sq.In.	Maximum Pressure Developed Within Inclosure, Lb. per Sq.In.
¼	37	0.114	62.0
⅛	148	0.454	25.7
⅜	329	1.010	nil

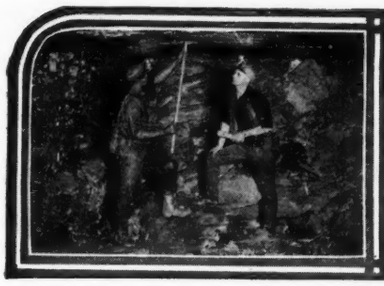
Perforated sheet brass can be obtained commercially with holes of various patterns of 3/32 in. thickness. No type of sheet was found to prevent an external ignition under all conditions of test when a single thickness was used, but four types were found to be satisfactory when used double. Of these four types the most suitable has a thickness of sheet of 3/32 in., 108 holes per square inch, an average open area per square inch of sheet of 0.224 sq.in., an average area of each hole of 0.00295 on the obverse and 0.00207 sq. in. on the reverse side, the holes being arranged in rows and rectangular.

"At least two such sheets must be used, one above the other each having an area of 1 sq.in. per liter of inclosed explosive mixture. They can be separated by a 1/16-in. space. Rapid release of pressure is afforded by this arrangement. The ingress of dust can be prevented by superposing a sheet of lead foil 0.005 in. thick, and this can be protected by a grid of thick wire."

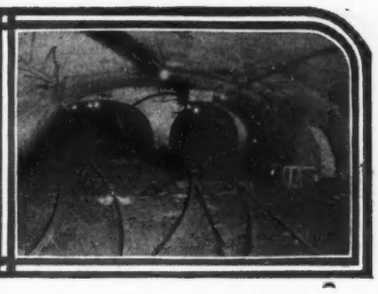


Rock-Dust Machine, New Orient Mine

New Orient authorities are stalwart advocates of rock-dusting It has proved its merit already in an explosion that might have been disastrous to the whole operation. The mine which uses this machine is at West Frankfort, Ill., and is owned by the Chicago, Wilmington & Franklin Coal Co., of Chicago, Ill.



Underground Operation



Cut Out Sixteen to Thirty Inches of Dirt

Cutting out a clay seam in a coal bed seems an undesirable operation, but after all it is not much more difficult than making an undercut in the clay, especially if the seam is not too thick. It has some advantages over undercutting in the clay in that, after the rubbish which has been mined has been cleaned up on the slick floor of the coal seam, it is quite easy to shovel up the coal as soon as it has been shattered by a shot. Both for rubbish and for coal, the top of the underclay usually forms a good shoveling basis. The floor being smooth the coal when shoveled is not mixed with clay. So sometimes a clay parting is almost an asset, at least it is not such a debit as some would at first assume.

The Royal Blue Coal Co. in eastern Tennessee, according to *Electrical Mining*, mines the Jellico seam, the upper bench of which is 3 ft. thick and the lower bench 2 ft. The bone and rash stratum lying between is from 16 to 30 in. thick. The clay is cut out by an overcutter which goes three times forward and three times backward across the face, cutting and cleaning alternately. Hoes are used to complete the cleaning of the kerf. Only 12 per cent of the coal passes through a 2-in. screen at the tipple.

Miner's Pick Handle Need Not Be Scorched When Forged

When miners' picks are heated in an ordinary forge the handles are likely to be scorched and burned. The Valier Coal Co. suggests doing this job electrically and thus eliminating this trouble. As shown in the accompanying illustration the "forge" consists of a wooden tub filled with a salt solution. An iron plate 18-in. square and ⅜-in. thick lying at bottom of the tub, immersed in the solution, forms the positive electrode and an iron bar fastened across the top of the tub constitutes the negative electrode.

In use one end of the pick bit is placed against the bar while the other end is dipped in the brine bath to a depth equivalent to the desired heating zone at the pick point. In a few seconds the metal is heated to a forging temperature whereupon it may be quickly pointed on the anvil, which should be conveniently located near the tub. Rivets may be heated in a similar manner by attaching the negative wire to the tongs in which they are held. Direct current of course is used and the handles of the tongs are carefully insulated.

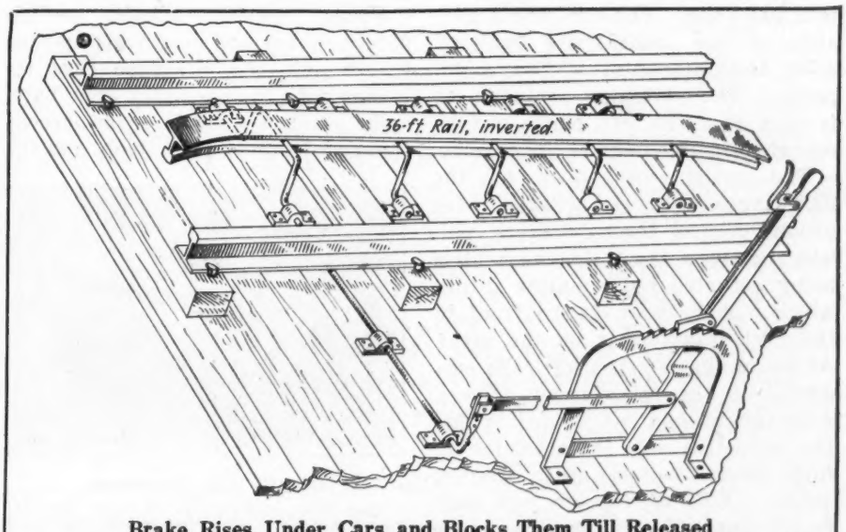
Heating a Pick Point Electrically

In the tub is a brine solution with a degree of concentration so determined as to carry the desired current. The positive electrode consists of a large, flat iron plate which lies in the bath, at the bottom of the tub while the negative electrode is the flat bar which rests on its top.

Car-Body Brake Controls Trips on Tipple

At No. 8 mine, Rock Springs, Wyo., the Union Pacific Coal Co. has installed a simple brake to control the loads on the incoming tipple track. This device has given entire satisfaction. The brake shoe is placed between the rails and consists of a 30-ft. rail supported by a number of U-shaped pieces, the ends of which rest in bearings, as shown in the accompanying illustration. The rail is thrust upward against the lower side of the car bodies by a hand lever controlled by a notched sector. In operating the brake the cars are first uncoupled and then by slackening off the brake, the foremost of the loaded cars is enabled to run forward, the remaining cars being stopped by the brake. The device was made and installed by Axle Johnson and J. Pryde, the blacksmiths at No. 8 mine.

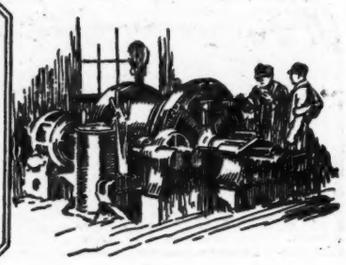
W. W. MEDILL,
Assistant Superintendent,
No. 8 Mine.
Union Pacific Coal Co.,
Rock Springs, Wyo.



Brake Rises Under Cars and Blocks Them Till Released

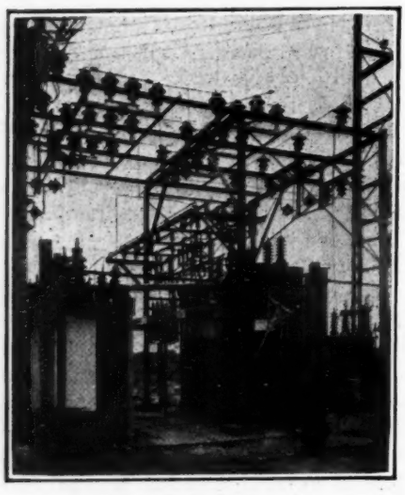
A means of releasing one car at a time to run toward dump and of holding the others till their turn comes. The cars are thus ready to bound forward when the brake lever is thrown.

Practical Pointers For Electrical And Mechanical Men



Station Switching Performed With Safety From Ground

In the accompanying illustration may be seen the transformer station, at the Valier mine of the Valier Coal



Ground Control of Transformer Switches

Switches in the 33,000-volt circuit are operated through levers, ropes and pulleys by a master throw installed within convenient reach from the ground. The 2,300-volt oil switchees are of the outdoor type.

Co., in southern Illinois, where the potential of incoming electrical energy is stepped down from 33,000 to 2,300 volts. The equipment consists of one transformer bank of 2,000 and another of 1,500 kva. capacity. The switching arrangement is such that the two banks can be operated individually or in parallel.

The switch mechanism on the 33,000-volt side is arranged for ground control through levers, pulleys and ropes, the entire mechanism being actuated by a master throw, which may be seen on the front of the first transformer on the right. As the mechanism is electrically connected to the transformer frames, a perfect ground is provided so that the operative may manipulate the high-tension switches with absolute safety. This mechanism was built by the Royal Electric Manufacturing Co. of Chicago, Ill.

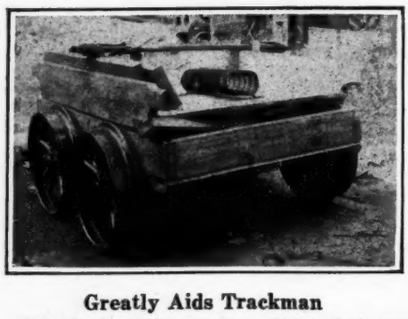
The secondary or 2,300-volt side of each transformer bank is connected to the station bus through 800-amp. oil switches of the outdoor type. These assure safety in breaking the 2,300-volt circuit under heavy load. This portion of the equipment was furnished by the Conduit Electric Co. of Boston, Mass.

Little Push Car Is a Help To Tracklayer

One of the difficulties encountered by the tracklayer within the mine is that of transporting his tools and equipment. One or even two men unaided cannot do much at moving rails, ties and other track materials to the point where they are to be put permanently into place. As a rule, therefore, such materials must be hauled in and distributed from a trip of mine cars.

In the accompanying illustration may be seen the tracklayers push car as built and used at the Dresser mine of Walter Bledsoe & Co., near Terre Haute, Ind. The wheels of this car are of presed sheet steel and are correspondingly light in weight. The planking and flooring of the car body are also comparatively light so that the completed car may be easily lifted or pulled off the track.

Frogs, switch stands, switch points, spikes and even rails may be loaded onto one of these cars together with the necessary crow bars, spike pullers, mauls, jim crows, tamping irons or other tools and the car pushed to the point where work is to be done. Here, after being unloaded of its heavier contents it may be set off the rails and out of the way either beside the track or in some convenient breakthrough. When the job is completed any defective material that has been replaced can be loaded up and taken to the shop for repairs. It is estimated by the management of this mine that one of these cars practically doubles the amount of work that a trackman can perform.



Greatly Aids Trackman

This little push car is so light that one man can drag it off or put it onto the track, yet it is big enough and strong enough to carry a good load of tools and track materials. It much increases the tracklayers efficiency.

Twisted-Pair Popular for Inside Phones

The character of the roof and the quantity of moisture from condensation or seepage are the principal conditions determining the type of construction best suited to inside telephone lines. But, even under almost identical conditions, the practices of different companies are at wide variance.

For instance, some prefer to use bare single conductor in preference to insulated twisted-pair even though this requires double the number of insulators or suspensions. The chief advantage claimed for the bare wire is the ease of locating and repairing trouble. Others that have tried, but given up, the use of twisted-pair claim they were disgusted by the frequent shorting of the conductors after the wire "got a little old."

Despite certain objections, twisted-pair continues to have a wide range of use for inside telephone lines. Such a line has been installed and has proven satisfactory at the world's largest mine, New Orient, at West Frankfort, Ill.

The conductors of this line are No. 12 soft iron, tinned to prevent rusting. The insulation of each wire consists of approximately 1/32 in. of high-grade rubber compound, and a braid impregnated with weatherproof compound and then waxed. This type of line appears to give quite satisfactory service in New Orient, which is quite a dry mine.

Book Review

Is Mine Workers' Union an Inevitable Outcome of Evolution?

From his title page to his conclusion Arthur E. Suffern in his book on "The Coal Miner's Struggle for Industrial Status" exhibits a partiality for unionism, and this is strengthened by his careful abstention from any reference to the violence with which the union has supported its attempts to spread its authority. The assumption that the miner has the right to bargain collectively seems to be throughout the book a basic principle. It is a part of the rhythm of the tune.

From the first it is stated as part of the natural evolution of things. It is not a new creation, but the final stage in the process that has been progressing majestically through the centuries. It is not by chance that the word "evolution" appears in the subtitle "A Study of the Evolution of Organized Relations and Industrial Principles in the Coal Industry."

Collective Bargain Not New

Harold G. Moulton, the director of the Institute of Economics, under the auspices, and with assistance, of which this book was prepared, sounds the keynote in his preface:

"Owner and slave, lord and serf, master and servant, employer and employed, employers' association and trade union! Change and evolution are apparent in the very terms that have been used in defining industrial relationships in different eras."

The collective bargain, then, according to the director and to the author, who uses almost identical language, is no new creation; it is only the third stage in an evolution.

One cannot but regret that the author should state on the first page that "The union has found that violence is not necessary. For example, in the anthracite strike of 1925-26 the Governor of Pennsylvania officially expressed to the miners the 'thanks of this commonwealth for the steady support of law and order given by officers and rank and file,' and indicated his 'keen gratification that there has been, from start to finish of the largest strike in the history of the anthracite region, not a single case of disorder which made it necessary for the commonwealth to intervene.' "

Passing over the fact that this was a statement made by a man who desired the votes of the mine workers and was, therefore, not a wholly disinterested witness, it may be recalled that from the time the miners decided to quit in a body till the time a contract was made, no operator made an attempt to run his mines. Had there been such efforts perhaps the miners might not have been so peaceable. The operators, unimpeded by any contract, and free to open their mines at any time without the least suggestion of dishonor, chose to keep them closed to all but maintenance men and submitted to union exactions as to their number.

The operators acquiesced in all the union's rulings, hired no strike breakers, offered work to none of their old employees but submitted docilely to the union's fiat. What cause was there for violence? The union was in the ascendant. Its rules were law to the operator. No wonder Governor Pinchot was able to give the union a clean bill of health. The threat of violence was there if not the violence itself.

Resistance Was Useless

Fascism is peaceful and Italy is not being dragooned into compliance with the "black shirts," despite the public's fears and assertions, if arguments like these are allowed to have weight. One prefers to judge from occurrences where men have attempted to work and have had houses burned over their heads, have been dynamited and shot with their women and children. Does Mr. Suffern see only what he wishes to see? It seems so. Otherwise, he would not say as if he were talking of Gandhi, the advocate of non-resistance in British India: "The might of non-resistance is sufficient to require recognition and to force the acceptance of their right to representation and collective dealing. This development has a history behind it." It has indeed—one written in blood and iron.

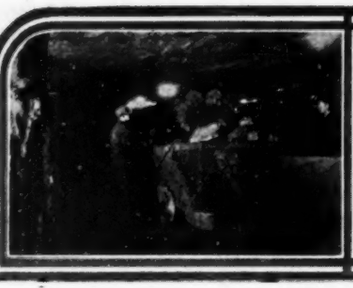
Mr. Suffern is cautious. He does not advocate any further evolution than is now considered part of the collective bargain, but he maps the way. The next step, as he explains, is that the employers shall open their books to public scrutiny. "If this demand were granted," says Mr. Suffern, "the status of the laborers in the industry would assume a position of new importance." With that he ends his paragraph and changes his subject.

There are further developments possible in the "industrial status" of the miner. Mr. Suffern proceeds to outline them, but, with equal caution, says nothing in their favor. "There is," he says, "regulation or public ownership." Apparently that is a further stage in evolution. Let us hope we do not have to face the complete process. We are told by scientists that evolution is sometimes arrested. When it reaches a certain stage it destroys the species. May that stage never be reached in this instance?

Let us not question that the collective bargain *is* a natural evolution, but is it the only one? The merchants of the world from a state of dependent serfdom gradualy obtained freedom, and they evolved by a similar process collective merchandising, for which has been coined the word "trust." Because an evolution is an evolution and nothing more, does not by that mark make it desirable or permissible.

Mr. Suffern's book is a painstaking record of the struggle of the mine worker to compel the operator to give him higher wages and better working conditions, also to let him have some hand in the control of operation. Perhaps what appears bias is due to the fact that the union is more ready than the operator to give the investigator in detail its side of the case. In the book's 459 pages, measuring 5x7½ in., is to be found a fairly complete account of the labor-union movement in coal mining, omitting all romantic and dramatic details. It is baldly factual. Mr. Suffern has gone carefully into the decisions of scale making and conciliation. He has reviewed employee representation plans. His patience has been amazing. He is not doctrinaire and consequently apt not to hold interest. The volume is cloth bound. It may be obtained at a nominal price from the publisher, the Macmillan Co., New York City.

R. Dawson Hall



News Of the Industry

British Mine Owners Still Obdurate On Question of National Agreement; Block Churchill Move to End Strike

Refusal of the British mine owners to consider any settlement of the strike which recognizes a national wage agreement has blocked the movement initiated on behalf of the government by Winston Churchill, Chancellor of the Exchequer, to end the stoppage of production which is now in its twentieth deek. Official notice of the rejection of the latest peace program put forward as the first step in a three-cornered conference between the producers, the mine workers and the government was served upon Mr. Churchill on Sept. 13. Further action by the government will await the return of Premier Stanley Baldwin, who has been resting at Aix-les-Bains.

The stand taken by the mine owners was foreshadowed in the preliminary conferences between the government and the representatives of the producers at London last week. At that time spokesmen for the owners stated flatly that they were unalterably opposed to any suggestion of a settlement that smacked of a national agreement. The idea that a compromise might be worked out which would permit a national formulation of district agreements proved as unacceptable to the operators as the latter's insistence that each district must in the future handle its wage situation independently of other districts has been to the executives of the British Miners' Federation.

Churchill for National Pact

The Churchill program, according to a semi-official report, proposed a national agreement to cover the general principles governing the settlement, supplemented by separate district agreements in conformity with these principles. There was to be an immediate resumption of work upon the conclusion of the negotiation of the district agreements. These latter agreements were to be referred to a central body for confirmation of provisions touching questions usually handled on a national basis.

A promise to refer the proposals back to the individual operators was the nearest that the spokesmen of the employers would come to meeting the government's program. On Monday of this week, representatives of the mine owners informed Mr. Churchill that their principals had voted overwhelmingly in favor of a rejection of his plan and were insistent upon a settlement based wholly on district agreements.

London dispatches say that the mine owners' determination to hold out against the national agreement is influenced by their belief that the resistance of the strikers is rapidly crumbling away and that President Herbert Smth and Secretary A. J. Cook of the British Miners' Federation are losing the support of the rank and file of that organization. Approximately 2,500 men have returned to work since last Friday and the total number now at the pits is estimated at 55,000.

End of Strike Believed Near

Despite the continued deadlock, there seems to be a feeling in financial circles in England that the end of the strike is in sight. That the prolonged stoppage has had a disastrous effect upon British financial and commercial activities is everywhere admitted. British industry, however, has kept up surprisingly well, but it has been compelled to depend upon imports of foreign coal to carry on. August imports were 3,970,422 tons, valued at close to $38,000,000. During the first four months of the strike coal imports totaled 6,896,000 tons, valued at $62,500,000, or about $9.06 per ton.

Bagpipe Makers Hard Hit By British Coal Strike

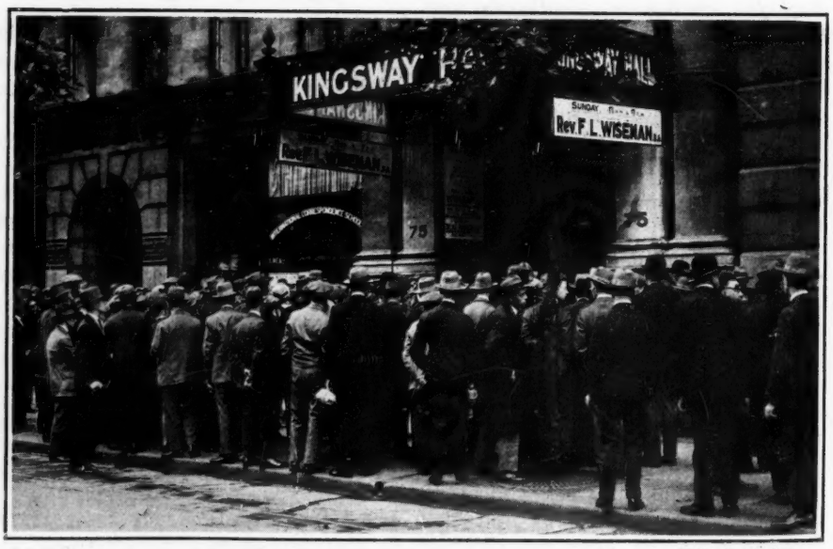
Scottish bagpipe manufacturers have been hard hit by the prolonged strike of British coal miners.

"Some of our best customers are the pipe bands in the mining areas, where more than a million men are out of work," said the head of one company, "and when they have no money to spend on bagpipes we are adversely affected."

Employees of mines in the Fifeshire district of Scotland are said to be among the most enthusiastic devotees of the pipes.

Depose Ohio Union Official; Disloyalty Charged

Charged with accepting money from operators to further his own interests and with being disloyal to the United Mine Workers organization, Robert Marshall, of Glouster, Ohio, president of a subdistrict of the Ohio miners' union, has been deposed from office by a unanimous vote of the state organization which was named by President Lee Hall to hear the evidence. Marshall has appealed to John L. Lewis, international president, for a review of the case. Union officials are watching the progress of the case with a great deal of interest.



Wide World Photos.

British Miners Meet to Discuss Policies

Conferences follow one another thick and fast in the British coal strike, now in its twentieth week. The strikers never fail to turn out strong, however, as shown in the above scene outside the Kingsway Hall when the executive delegates met to map out future policy and action.

Study of Miners' Working Hours Reveals Longer but Fewer Days For Americans Than Europeans

By Paul Wooton
Washington Correspondent of *Coal Age*

The British coal crisis is turning largely on hours of work. In part, this issue is the wage issue in disguise because a change in hours usually is accompanied by a demand by one side or the other for the same daily rate as was paid before.

Quite apart from this question, however, the discussion going on in the coal-mining industry of Europe deals with hours of labor to a degree that is much more noticeable than in the United States. The union bituminous mines of this country have enjoyed the eight-hour day since 1898. The non-union mines gradually adopted it as well. The anthracite region went on an eight-hour basis for most inside occupations in 1916. In 1923 the eight-hour day was extended to the remaining underground workers.

It is true that the demands presented by the union bituminous miners in 1919 included the six-hour day and the five-day week, but although written into the union's constitution this never has been a principal objective in the minds of the miners' leaders.

Europe Keen for Actual Time Data

In Europe there is very keen interest in the statistics of the actual time worked by the men who go into the mines. European students who seek information concerning the American coal industry are surprised to find a lack of such records here. Perhaps the reason is that since the adoption of the eight-hour day the issue of working time never has been an important one. Nevertheless, in comparing European and American conditions it is important to know the relative working time. This can be done through the use of some recent studies by the Bureau of Labor Statistics of the Department of Labor.

The Bureau now has made three surveys of wages and hours of labor in the coal-mining industry. In the latest of these—Bulletin 316—and in articles in the *Monthly Labor Review* (July, 1925, pages 69-90, and February, 1926, pages 77-87) the Bureau gives information about the length of time actually worked by the men in the mines.

In the United States, in contrast with the practice in Europe, the mine worker is paid only for the time he is at work and not for the time he may spend in going from the mine entrance to his place of duty. In most districts where the eight-hour day prevails the worker is supposed to be at his post for eight hours in addition to time for lunch. So far as the daymen are concerned this provision usually is observed by the men and enforced by the management. For this reason the daymen are underground, on an average, for considerably more than eight hours. The average time worked by inside daymen in the bituminous mines, according to the Bureau of Labor Statistics, is 8.2 hours; in the anthracite mines it is 8.5 hours. These figures for anthracite represent all the inside daymen and also the company miners and their laborers.

Any time the daymen may spend in going from the mine mouth to the place where they report for work, and from the working place back to the mine mouth, would be in addition to that figure. Just how much this addition amounts to is not shown by the Bureau's records, but when it is remembered that most daymen report for work at a point near the bottom of the shaft the difference cannot be great. The working time of daymen below ground in American mines may be summed up, in the bituminous industry, as averaging something over eight hours, and in the anthracite industry as averaging considerably above eight hours. In some anthracite occupations there is considerable overtime.

Enforcement Lax on Contract Men

For the tonnage or contract men the showing is different. They are all piece workers and work with a minimum of supervision. The requirement that they work for eight hours which frequently appears in wage contracts is not enforced.

In the bituminous mines during the period covered by the Bureau's study the loaders and machine miners spent an average of 7.7 to 7.8 hours at the face, including the lunch time, which may be supposed to require not more than half an hour. The machine cutters are on duty longer and average 8.2 hours, including the lunch period. For the entire group of workers in bituminous mines the average is 7.8 hours, including the lunch period.

For the men who work at the face there is considerable additional time spent in travel from the mine mouth to the working place and back again. According to the best information that the Bureau of Labor Statistics was able to get from the miners the time thus consumed ranges from twenty minutes to an hour or more, with the average around forty-five minutes. This is the total time for going and coming. Added to the time spent at the base it appears that the loaders and pick miners were underground on an average of 8.4 hours; the machine cutters, 8.8 hours, and the entire group of tonnage workers 8.5 hours.

These observations for bituminous tonnage workers show more hours per day than most mining men would suppose. In explanation it should be noted that they include non-union mines and represent a period of slack work when the men had a strong incentive to take full advantage of the opportunity to labor.

In the anthracite mines, curiously enough, the average time the tonnage men are at work is somewhat less than in the bituminous mines. The contract miners put in 6.8 hours at the face, including lunch, and a total of 7.5 hours in the mine. The contract miners' laborers spend 7.2 hours at the face and a total of 7.8 hours in the mines. Including consideration miners and their laborers the contract men in the anthracite mines average 7.3 hours at the face and 8 hours underground.

Workers above ground have longer average working time than those below. For the bituminous mines the average time spent at the place of duty is 8.6 hours, and for anthracite 8.9 hours (including lunch).

Americans Below Ground Longer

According to these figures the time spent underground in American mines is somewhat greater than the average in the United Kingdom, France, Belgium or Czechoslovakia. In those countries, according to the report of the British Royal Commission, the average time below ground is now eight hours. The anthracite contract miner and laborer constitute an exception. If Great Britain goes back to the longer day her men will average nine hours underground, or distinctly more than in the United States.

While these figures are based upon samples, the samples seem to be reasonably representative. Data have been collected from one payroll in the winter of 1921-22 and from one payroll in late 1924. The representativeness of the samples will be seen from the fact that the 1924 study covered 44,500 anthracite workers, or 28 per cent of the total in the region, and 140,719 bituminous miners, or 23 per cent of the total in the bituminous industry. The bituminous miners were scattered over thirteen states and covered both union and non-union operations.

In making any comparison between the United States and foreign countries it must be remembered that the conditions of work in American mines are much easier. Great depths, high temperatures and the occurrence of water, which characterize many European mines, make the miners' immediate surroundings more exhausting and may very well justify a shorter working shift. Furthermore, American bituminous miners are putting in only 150 days a year below ground, or about one-half of the days underground put in by the Continental miner. Under such conditions the American miner works at a faster pace than he would be able to maintain were the mines open every day. In the anthracite region the time worked by the miners is 270 days, about the same as in the United Kingdom and only 30 days less than on the Continent.

EDITOR'S NOTE.—*The foregoing Washington letter reflects certain views of official Washington. Due to the fact that policy as a rule prevents government officials from permitting their views being quoted directly, the authority for these reports is necessarily somewhat vaguely referred to. The views reflected are not those of any one group of officials, but of different men, in the legislative and executive departments. There is no necessary connection between their views and* COAL AGE *editorial policy; neither do they necessarily represent Mr. Wooton's personal views. It is felt that the opinions thus faithfully reflected will be of great interest to the industry. Where opinions are cited from sources outside of the government, the source will be specifically related.*

Lake Cargo Rate Hearings Postponed to Oct. 25

Further hearings by the Interstate Commerce Commission in the *Lake Cargo Coal Rate Cases, 1925*, tentatively set for Sept. 14, have been postponed until Oct. 25. The hearings will be held at the offices of the Commission in Washington, D. C., before Commissioner Hall and Assistant Chief Examiner Gerry, who presided at Atlantic City, N. J., in July when the proceedings were reopened for the taking of additional testimony.

Reopening of the inquiry followed protests from Ohio and Pennsylvania lake cargo coal shippers against the original decision, in which the Commission declined to disturb the existing adjustment of lake cargo rates. The complaining shippers are supported by the Ohio and Pennsylvania state authorities. The United Mine Workers district organization in Illinois also has intervened. Southern operators and railroads are insisting that labor conditions, not freight rates, explain the decline of the influence of the northern producing fields.

New Ohio Scale Not Likely To Be Statewide

With partial resumption of operations in the southern Ohio field in sight, the plan to open mines in that field on the recently approved scale of the Ohio Coal Operators' Association does not look as bright as it did several weeks ago. All of the mines in the Hocking Valley and Cambridge fields which may be opened soon will work on the Jacksonville scale. The opening is the result of a better domestic demand which has stimulated the use of Ohio coal because of inability of dealers to obtain prompt shipments on coal from West Virginia and Kentucky.

The situation in the eastern Ohio field is very similar. Several mines in Belmont County, particularly the Stanley mine of the Lorain Coal & Dock Co., the Rosemary mine of the Maher Collieries Co., and the Massillon-Belmont mines, near Flushing, will be opened soon. Wheeling & Lake Erie mine No. 7 also will start soon. The Ohio Short mine near Flushing has been operating for several weeks, as has the Seloway mine at Barton, Belmont County.

In the meantime the officers and executive committee of the recently organized Ohio Coal Operators' Association are working to perfect the organization and to get matters in shape for wage scale negotiations previous to the expiration of the Jacksonville agreement, on April 1 next. The definite announcement that Ohio operators would not join with those from Illinois, Indiana and western Pennsylvania in negotiating a scale still stands and a long-drawn out fight with the United Mine Workers is in prospect.

Pape Chosen as Secretary of New Coal Association

Delbert H. Pape, who for the last two years has been assistant to Harry L. Gandy, executive secretary of the National Coal Association, has been chosen executive secretary of the Monongalia County Coal Operators' Association, recently formed by operators along the Monongahela Railroad in northern West Virginia. Mr. Pape will enter upon his new duties Oct. 1 with every promise of success in developing the organization to function effectively in the interests of its membership.

During his service with the National Mr. Pape has firmly established himself in the esteem of coal operators of the country. His broad experience in the industry has stood him in good stead and will undoubtedly make for a high degree of efficiency in his new endeavors.

Delbert H. Pape

After receiving a high school and business college education, Mr. Pape went directly into the mines, working under every classification of labor up to and including the position of foreman. He was then for something over two years connected with the Denver & Rio Grande and the Oregon Short Line railroads in stenographic and secretarial capacities. From 1907 to 1913 he was associated with the Central Coal & Coke Co., first in the capacity of secretary to the general Western manager, then as chief clerk in the wholesale and retail departments, and later as Western sales agent. From 1914 to 1922 he was general manager of the Lion Coal Co. at Ogden, Utah, embracing the Wyoming Coal Co. and the Union Fuel Co. in Wyoming and the Wattis Coal Co. in Utah. During his management of those properties the tonnage increased from 150,000 to over 500,000. The Wyoming mines were union and the Wattis mine in Utah, non-union.

In co-operation with P. J. Quealy, of the Gunn-Quealy and the Kemmerer coal companies, he organized the Southern Wyoming Coal Operators' Association, and during the war was appointed by U. S. Fuel Administrator Dr. H. A. Garfield as distributor of coal mined in southern Wyoming.

Fishwick Likes Presidency

Harry Fishwick, who was elevated to the presidency of District No. 12, United Mine Workers (Illinois), when the executive board deposed Frank Farrington, Aug. 30, likes his new job so well that he has already announced his candidacy for election to the office in December. His appeal to the miners of the state is as follows:

"I have served as vice-president for a number of years and have carried out every order that has been assigned to me in line with the laws of our unit. I now ask the membership of our union in Illinois to give me the opportunity to administer the affairs of our organization, as I believe I am fully entitled to that honor by reason of my years of service in the capacity of vice-president. I have no quarrel with those who are in any way desirous of being elevated to the presidency of our union and I solely promise that nothing will be done by me which will injure or destroy the solidarity and integrity of the United Mine Workers of America."

New Coal-Discharging Plant Completed at Boston

A battery of six coal-discharging towers completed at Mystic Wharf, Boston, last week, at a cost of half a million dollars, has provided the port with facilities that compare favorably with those at any other port. The largest steamers can be emptied of coal cargoes within eight hours, it is said. The plant is expected to handle more than 1,500,000 tons a year.

This new adjunct of the Boston & Maine R.R., which will transfer coal directly from ships to cars for the railroad's use or for distribution to industries in Boston and northern New England, will be operated by the Mystic Terminal Co., of which E. S. French is president. A big gantry distribution bridge has been built by the railroad to effect more economical handling of its storage coal.

This modernized battery of coal unloading towers comprises three new steel structures equipped with buckets which carry three tons of coal in each operation and two other towers equipped with one and one-half-ton buckets. Work on the Mystic Wharf plant began on Jan. 1.

Storm Cripples Indiana Mines

About twenty-five shaft and strip mines in the Terre Haute (Ind.) field were forced to suspend operation last week when a cloudburst descended on Sept. 9. It was the third flood that swept the Middle West within ten days. More than 5 in. of water fell within the space of six hours, flooding many pits and workings. Railroad traffic was impeded, which also was a contributing factor to the mines' suspension.

Rocky Mountain Coal Men Discuss Many Phases of Mining

About seventy members of the Rocky Mountain Coal Mining Institute met at Glenwood Springs, Colo., on Sept. 9 to hear papers covering many phases of coal mining—timber preservation, shearing of coal, mechanical loading, mine layouts and the washing of domestic coal. The discussions were unusually full and animated.

The safety committee brought in a report which was in part accepted and in part returned to the committee for further consideration. Each section, however, was vigorously debated. Every spare moment between sessions was filled with swimming, golf and dancing. Glenwood Springs, having thermal waters, gives ample opportunity to those who delight in natatorial sports. The waters have medicinal qualities.

"The Colorado Fuel & Iron Co. at Primero, Colo.," said F. T. Baker, a superintendent of that company, "found in 1920 that its timber costs were 29c. per ton, because of the extremely bad roof at this mine. In return airways timbers soon became valueless and after two years needed to be replaced. So open-tank treatment with creosote and aczol was introduced with satisfactory results. The timber that has been creosoted properly has lasted already three and a half years, the chemically treated four years, and in neither case is the material in any way weakened by fungus or decay, except where it was cut after treatment and not given a brush coat where cut, or where it was scraped or malhandled after it was treated. Untreated timber near by decayed so badly after three and one-half years that a 4-in. steel blade could be pushed into the timber near the bottom."

Heavy side pressures and a weak coal made the timbering of the Primero mine of the Colorado Fuel & Iron Co., Primero, Colo., an expensive proposition for which some solution had to be found, because the return air in the mine cut the effective life of timber down to two years. As the roof often scaled from 5 to 15 ft. within 24 hr. of the coal being extracted the quantity of timber used may be readily imagined. The annual expenditure for timber of all classes was about $60,000.

Decay Sometimes Overlooked

Mr. Baker called attention to the fact that a timber might not fall or fail, but might be so decayed that it would be utterly ineffectual if a load came on it. The effective life of a timber often is far less than the time during which it is left in place to masquerade as a protection to the roof.

The timber was treated by open-tank methods, ten posts being put in a cage and lowered into the tank. There are two treatment tanks and each will hold two cages. Creosote is admitted till the timber is submerged. Then the temperature is raised by steam to a point between 150 and 200 deg. F.

Charles Billington, Lafayette, Colo., advocated the use of lime and salt as a preservative, but declared he did not feel disposed to say whether other treatments were or were not better.

Whether shearing was advantageous in certain kinds of coal was discussed by John H. Emrick. Mr. Emrick said that the question had to be answered for every mine. He declared that in one mine the slack produced was reduced 12 per cent and the quantity of explosives used 25 per cent by the practice of shearing, the speed of driving entry being increased 50 per cent.

It was stated by William Littlejohn that in a part of the Clear Creek mine where the coal was 13 ft. thick the use of a shearing machine was found quite helpful. Even T. A. Stroup admitted the success was phenomenal. The quantity of powder used was halved. Where Mr. Stroup made the observations embodied in his article the coal was said to have been about 6 ft. thick.

Discussion veered to the relative advantages of undercutting and overcutting as regards the production of slack. Opinions differed; many claimed that much overcut coal would shoot better than undercut coal because of favoring conditions.

Changes Methods to Boost Output

On Friday morning W. C. Holman delivered an address written by Scott Dupont on the "Experiments at Dawson in Increasing Production per Man by Changing Mining Methods." Mr. Holman detailed the methods of operation with long faces, scraper conveyors and scoops, but did not go extensively into the economies effected, saying that the experiments were primarily to obtain data as to roof action and safety in operation with the new methods.

D. W. Rockey, of Santa Fé, N. M., spoke on vocational training for mine workers, calling on Mr. Holman to describe the underground school conducted at Dawson, N. M., for beginners at the mines. Mr. Rockey said that schools could be started at mines with the aid of federal and state educational grants and wanted the educational committee of the Institute to sponsor this movement. To this end the educational committee was made permanent and asked to report at the winter meeting. Mr. Ryan of the Bureau of Mines read a communication from J. J. Forbes on the Joseph A. Holmes Association and the Secretary read one from Dan Harrington on the large number of fatalities in the Rocky Mountain region, which exceeded that in any other part of the United States.

Later W. C. Bracewell read the report of the Committee on Safety, but as the meeting did not seem sufficiently representative of all the various states in the Rocky Mountain group exception was taken to the final acceptance of the proposals. Some that were noncontroversial were adopted but the rest were referred back to the Safety Committee, among them one on the exclusion of open lights and black powder from all mines showing traces of explosive gas. The report, which was signed by George B. Pryde, chairman, refused to define definitely what should be termed an accumulation of gas and how it should be moved.

In the afternoon S. W. Farnham discussed "Late Developments in Mechanical Loading," having reference to new power shovels, three-drum scraper loaders, entry loaders and shaking conveyors and loaders. He also referred to the restrictive effect of legislation on the development of modern loading machinery.

At the banquet, R. Dawson Hall acted as toastmaster, introducing W. A. Seiffert, of Albuquerque, N. M.; W. Littlejohn, of Price, Utah; Mrs. A. L. Jones, S. W. Farnham, Chicago, Ill., and Ole Thorson, of Glenwood Springs.

At the Saturday meeting I. M. Charles discussed the "Washing of Domestic Coal at Alamo, Colo." The nut coal at this plant contains the greater part of the impurity and is accordingly the only part washed. This is done with jig washers, about 75 per cent of the coal being shipped to market as nut, 4 per cent as coarse sack, the outcome of degradation, and 11 per cent being burned under the plant boilers after being crushed.

Denies Indiana Seeks Cut In Jacksonville Scale

Rumors that the Indiana Bituminous Coal Operators' Association had asked a conference on a wage agreement with officials of District No. 11, United Mine Workers, have been denied by William Blakely, of Terre Haute, assistant to Phil H. Penna, secretary of the Indiana operators' organization.

While Blakely declined to speak with authority on the matter, he declared that the operators' association has never sought a conference with union officials for the purpose of modifying the Jacksonville agreement and that, to the best of his knowledge, no such move is now contemplated.

Mr. Penna is now vacationing at his summer home at Cacatawa Park, Mich., and will not return to his Terre Haute office for several days.

Three Months Strike in Ohio Settled at Union Scale

A strike at the Provident mine of the Clarkson Coal Co., near St. Clairsville, Ohio, which lasted about three months, has been settled. Headquarters of the 5th Ohio subdistrict, United Mine Workers, announced that the 600 workers normally employed at the plant were scheduled to return to work early this week. A strike was called by union officials in June after the management had discharged seventy men on the ground that they had been loading dirty coal.

All of the former employees are being re-employed on the basis of the Jacksonville scale but with the understanding that union officials will see that the loading of "dirty" coal in the future is stopped.

Illinois Coal Team Takes First Place In Mine Rescue, California Oil Men In First Aid at International Meet

The Madison Coal Corporation team of Carterville, Ill., carried off first honors in mine-rescue work at the Fifth International First-Aid and Mine-Rescue Contest, held at San Francisco, Cal., Sept. 2-4, under the auspices of the U. S. Bureau of Mines. This team was awarded the Congressional bronze medallion, the National Safety Council silver cup, *Coal Age* silver cup, the *Rocky Mountain News-Denver Times* silver cup and one donated by *Coal Industry*. The Pacific Coast Coal Co. and the Washington Union Coal Co. teams, both from the State of Washington, were tied for second place, which the former won on the flip of a coin.

High score in the first-aid contest was made by the Shell Co. team, of San Francisco, which captured the Congressional bronze medallion, a silver cup presented by the Illinois Coal Operators' Association, a gold medal donated by the National Safety Council and the National Red Cross bronze medal. Second prize went to the El Segundo team of the Standard Oil Co. of California, and third to the Richmond team of the same company.

The meet was held in connection with a safety week program sponsored by the Society of Safety Engineers of California. Forty-four teams from thirteen states took part in the first-aid contest, which was held in the Civic Auditorium. Coal and metal mines, petroleum companies and cement manufacturers were represented by teams. Fourteen teams participated in the mine-rescue contest, which was run off in the Greek Theatre of the University of California, Berkeley. W. D. Ryan, of the U. S. Bureau of Mines, conducted the meet and a corps of San Francisco physicians acted as judges.

Each of the mine-rescue teams worked out a similar problem in a model mine working so constructed as to afford a searching test of the capabilities of the teams in full regalia, as it were, including oxygen apparatus, tools, lamps, life line and stretcher. The work involved testing of the working for gas, traveling along an entry, up a gas-filled passageway equipped with ladders, the erection of a temporary brattice, the rescue of an injured man who was secured to a stretcher and provided with oxygen outfit and the bringing of the victim out over a steep incline and through another section of gas-filled chamber and along a short section of entry.

On Saturday evening the workers, judges and guests were given a banquet. Dr. D. J. Parker, chief engineer of the mine safety service of the U. S. Bureau of Mines, presided, and after an address of welcome introduced the toastmaster, Dean F. H. Probert of the University of California. C. W. Merrill spoke on behalf of safety and the relation of the American Institute of Mining and Metallurgical Engineers to this important feature of mining. Dr. R. R. Sayers announced the award of replicas of "Sentinels of Safety" to mining companies that had achieved notable safety records during the year. The recipients were: In anthracite coal mines, the Hazelbrook Coal Co., Upper Lehigh, Pa.; in quarry and open-pit operations, the North American Cement Corporation of Maryland; in the metal-mine group, the New York Mining Co., Picher, Okla.; in the bituminous coal mine group, the United States Coal & Coke Co., No. 6 mine, Gary, W. Va.; in the non-metallic group, the United States Gypsum Co., of Gypsum, Ohio.

Dr. Sayers and W. H. Cameron, managing director, National Safety Council, announced and distributed the prizes awarded to the mine-rescue teams. The state prizes, consisting of banners appropriately inscribed, were awarded as follows: Arizona—Phelps Dodge Corporation, Bisbee unit; California—The Empire Mines, Grass Valley; Illinois—Madison Coal Corporation, Carterville, Ill.; Montana—Anaconda Copper Mining Co., Butte; Virginia—Clinchfield Coal Corporation, Dante, Va.; Washington—dead heat between the Pacific Coast Coal Co. and the Washington Union Coal Co., the Pacific Coast Coal Co. winning on the flip of a coin.

In the first-aid contest state prizes were awarded as follows: Arizona—Phelps Dodge Corporation, Morenci team; California—Shell Oil Co., of Long Beach; Illinois—Peabody Coal & Coke Co. and Local Union No. 517, Tovey, Ill.; Kentucky—Fordson Coal Co., Kentenia; Louisiana—Standard Oil Co. of Louisiana; Montana—Anaconda Copper Co.; Oklahoma—Golden Rod Mining & Smelting Corporation, Cardin; Utah—Utah Copper Co.; Virginia—Clinchfield Coal Corporation, Dante; Washington—Pacific Coast Coal Co., Newcastle; West Virginia—United States Coal & Coke Co., Gary; Wyoming—Union Pacific Coal Co., Cumberland.

Sales of Explosives in July Exceed Total of Year Ago

Sales of explosives manufactured in the United States and sold in July, 1926, for domestic consumption amounted to 463,700 kegs of 25 lb. each of black blasting powder, 5,543,000 lb. of permissible explosives, and 27,801,000 lb. of other high explosives. These figures are based upon manufacturers' reports to the U. S. Bureau of Mines and include an estimate of sales by several companies that do not furnish monthly reports to the Bureau. Compared with July last year, the figures indicate increased sales of permissibles and other high explosives and a slight reduction in the amount of black blasting powder sold during the month.

Of the total sales, 379,066 kegs of black blasting powder, 5,427,057 lb. of permissible explosives and 3,166,035 lb. of other high explosives were used in coal mining.

Plan Joint Western Meeting Of Mining Societies

Arrangements are nearing completion for the joint convention of the western division of the American Mining Congress, American Institute of Mining and Metallurgical Engineers, American Association of Petroleum Geologists, and the American Silver Producers' Association at Denver, Sept. 20-24. Prominent government officials and outstanding mining men of the country will deliver addresses on important problems affecting the industry. Preliminary details for the convention are being handled by Jesse F. McDonald and M. B. Tomblin of the Western division, the Colorado Mining Association, and the Colorado chapter of the American Mining Congress.

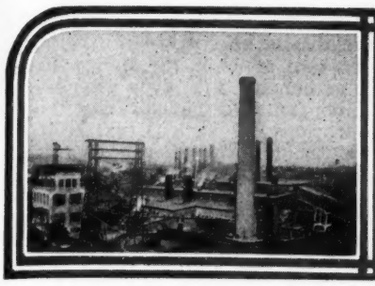
The convention will open on the morning of September 20 at the Cosmopolitan Hotel, followed by a luncheon to the delegates by the board of governors of the Western division. Mr. McDonald will preside over the afternoon session, when addresses will be made by Secretary of Interior Work and Representative Winter of Wyoming. A dinner will be given that evening when it is expected the speaker will be Secretary of Commerce Hoover.

Sessions of the A.I.M.E. will be held Sept. 22, when John W. Finch, presiding over the morning session and Charles W. Henderson over the afternoon session. Addresses will be delivered by Dr. H. Foster Bain, secretary of the Institute; Scott Turner, director, Bureau of Mines; M. F. Coolbaugh, president, Colorado School of Mines; Prof. A. J. Woinig, superintendent of the experimental plant of the Colorado School of Mines, and M. J. Gavin, refining engineer of the Bureau of Mines.

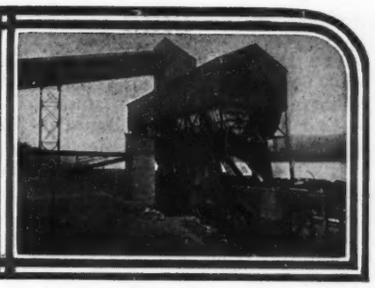
At the afternoon session addresses will be made by Director George Otis Smith of the Geological Survey; W. C. Mendenhall, chief geologist of the Geological Survey, on the Colorado cooperative survey; G. F. Loughlin, chief of the metallurgical geology section of the Geological Survey, and C. H. Birdseye, of the Geological Survey, on topographical mapping.

Secretary James F. Callbreath of the American Mining Congress will preside over a meeting of the Western division on the morning of September 23, for which speakers are being selected. The afternoon will be devoted to a trip to the experimental plant of the Colorado School of Mines at Golden, going over Lookout Mountain, concluding in the evening with an elk barbecue and dinner at the Motor Club with incidental dancing. The convention will end on September 24 after a morning session of the Western division with Mr. McDonald presiding.

Seeks Bids on Locomotive Fuel.—The Virginian Ry. will receive bids until Sept. 23 for high-volatile mine-run coal for locomotive fuel required during the year beginning Oct. 1, next. About 600,000 tons will be needed, delivered at the rate of approximately 50,000 tons per month. Tenders are to be submitted to D. C. King, purchasing agent, Terminal Building, Norfolk, Va.



News Items From Field and Trade



ALABAMA

The Alabama Fuel & Iron Co., of which Charles DeBardeleben, of Birmingham, is president, has adopted a program of group insurance providing 1,500 miners and other employees of the company with approximately $2,000,000 of life insurance protection.

ILLINOIS

The John P. Taylor Coal Co. of Belleville, has started drilling on a tract of coal land in Stookey Township, St. Clair County, for the purpose of testing for strip mining. The company is said to hold options on approximately 2,000 acres of land in that district and in all probability will establish a strip operation if the tests being made warrant it.

A number of residents of Edwardsville are considering the organization of a new coal company to take over and operate the Henrietta Mine. A. W. Miller, former manager of the mine, will have charge of the property when the plans are completed. The mine has been operated at intervals during the past thirty years. It was sunk by the late Henry Voge, who is said to have lost a large sum of money in the property.

Mine Idle Five Months Resumes.—The Keystone mine, Marion, operated by the Wall Coal Co., resumed operations Sept. 1. The shaft employs 300 men. It had been idle since last April.

Fewer Miners Idle.—Employment in the Illinois coal fields is on the increase and the outlook is improving according to officials of the United Mine Workers at Springfield. Eleven additional mines were reopened last month while many others will resume work soon. Industries and railroad are beginning to store coal in anticipation of a strike next April, when the present wage agreement expires.

The McGill Coal & Coke Co., Chicago, has been appointed exclusive representative in Chicago and vicinity of the Green River Fuel Co., Inc., western Kentucky operator. The McGill company in the past has been the direct representative of the shipper in the Wisconsin territory and will continue to act in that capacity.

St. Louis Awards City Contracts.—The St. Louis Board of Standardization has awarded the city coal contracts for the year opening September 1. In all about 145,000 tons will be used for a total of $425,000. The awards are as follows: S. Seidel Coal Co., 85,000 tons screenings for city water works, $2.625 per ton; Crerar Clinch Coal Co., 9,000 tons mine-run, $2.835 per ton; Southern Coal, Coke & Mining Co., 5,000 tons No. 4 wash coal; Inland Valley Coal Co., 24,000 tons at $3.86 and $3.98; Berry-Bergs Coal Co., 5,200 tons at $3.58; Eagle Packet Co., 2,000 tons, $4.65, and Berry-Bergs Coal Co., 15,000 tons at $3 91.

Mine No. 7 of the Consolidated Coal Co. of St. Louis, Mo., at Herrin, resumed operations on Sept. 1. It employs about 700 men. The Bobby Dick mine in Herrin also opened on Sept. 7.

The Chicago Coal Merchants' Association took in eighteen new members last week. It made a total of thirty-five secured in a thirty-day campaign under the leadership of Robert Clark, president of the Clark Coal Co. The eighteen new members are the Arquilla Brothers Co., Bohemian Coal Co., Economy Fuel & Material Co., F. J. Franzen, H. & N. Coal Co., John Herrig Coal Co., Home Fuel & Supply Co., L. T. Huston Coal Co., James Coal Co., Thomas J. Kane, C. W. Koehler & Son, L. & L. Coal Co., Lauterbach Coal & Ice Co., Thomas Martin, Ridgeland Coal & Ice Co., F. M. Robinson Coal Co., F. C. Tueber Coal Co. and the West Town Coal Co.

Keystone mine, Herrin, reopened for business Sept. 1. This mine, which had been closed since last April, employs about 300 men when working at full capacity. The mine is controlled by the Wall Coal & Mining Co.

John Gotch and Michael Yarsinsky, both of Streator, have leased the Rutland mine, Rutland, until May 1, 1927, and will operate it this winter.

INDIANA

New Strip Field to Open Soon.—Installation of the first shovel for the Ohio & Indiana Coal Co.'s new strip field has commenced at a point three miles northeast of Oakland City. The company expects to start stripping in two months if favorable progress is made in installing the machinery. This will give Oakland City three active strippers. The Ohio & Indiana Coal Co. now has strip land sufficient to operate about four years and will buy more lands as needs develop. The new field is tributary to the Big Four Railroad, from which a switch line has been constructed.

Stripping Flourishes Near Brazil.—The Mid-Continent Coal Co., which recently leased 638 acres of coal land three miles southwest of Brazil in Posey township, has put a force of men to work laying a switch from the Pennsylvania tracks to its land, where large stripping operations are to be operated. Sixteen carloads of machinery, including a "350" caterpillar tractor shovel and several smaller shovels, are on the way and soon are to be placed in the stripping pit. All the machinery will be operated electrically, the company obtaining power from the high-tension line of the Dresser plant running through the property. The Mid-Continent company has had surveyors and drillers at work on a large tract five miles northwest of Brazil, where it plans to open another stripping pit. Several other large stripping pits are to be opened here this fall, the Maumee Collieries Co. having more than 2,000 acres of coal land under lease south of Brazil.

KENTUCKY

Labor Shortage in Harlan.—Nolan Mahan, general western manager for the General Coal Co., on his return to Cincinnati, from the Harlan fields, Sept. 8, said that there was a marked labor shortage there. He said that the operators at this time of the year have to await the pleasure of the "bootleggers and fodder gatherers," who are a bit slow this year in getting hold of inside jobs.

The C. L. Ryley Coal Co., Happy, of which C. L. Ryley is president, has increased its capital to take care of expansion, having taken over the Duane Mining Co. and Storm King Fuel Co. interests.

Lynch Mine Hits Stride.—In July the Lynch mines of the U. S. Coal & Coke Co. produced 196,338 tons of coal and in August about 208,200 tons, an average of 8,000 tons per day. In each of these two months there were 26 working days, and the outputs both exceed the preceding record month which was March of this year, in which there were 27 working days. The underground workings are being arranged for a sustained daily output of from 10,000 to 12,000 tons. The Lynch plant consists of two mines which dump coal over the same tipple.

NEW YORK

Sydney G. Lund, long a member of the Buffalo coal trade and resident manager of the agency of Whitney & Kemmerer till it was withdrawn, has taken the management of the business of an automobile company in Jamestown, N. Y., and will remove to that city on Oct. 1.

The schooner Burt Barnes, with a cargo of coal loaded at Sodus for Kingston, was lost on Lake Ontario off Long Point, Canada, on Sept. 4. The crew managed to get ashore after being adrift about 36 hours. The schooner was owned by George Hart of Pictou, Ont. This leaves only five schooners for business on that lake.

OHIO

To Discuss Fuel Situation.—District No. 6 of the Purchasing Agents Association will meet in Cincinnati Oct. 7, 8 and 9 and will hear Ben Tate, president of the United Collieries Co., explain the inroads of non-union coals into union territory. President Kirk Taylor, who is connected with the Illinois Glass Co., Alton, Ill., will sum up the fuel situation from the purchasers' viewpoint.

Work has been commenced on the big river plant projected by the Hatfield Reliance Coal Co. in Cincinnati which will be erected upon its property at the foot of Central Avenue. There the company has operated a small plant for several years, with a larger equipment at Riverside. The latter was sold some months ago to make way for improvements put in by the Big Four railway, and was vacated by the Hatfield Reliance concern the first of this month. The new equipment will consist of a river elevator, tipple and rescreening plant so that the coal brought by barges from the Kanawha can be entirely rescreened before going into the railway cars. The improvements will cost more than $100,000.

The Powhatan Mining Co., formerly the Cleveland & Western Coal Co., is transferring five Joy loading machines from the Bertha Consumers Co.'s mine at Scotts Run, near Morgantown, W. Va., to its own mine at Powhatan Point. These machines went through the mine fire and have been under water for several months but have been reconditioned and will supplement two other like machines that have been in use several months.

Mines to Resume at Union Scale.—Charles J. Albasin, secretary of the Eastern Ohio Operators' Association, announced recently that the Rosemary mine of the Maher Colleries Co., and the Massillon Elmont mine, both located near Flushing, would soon resume operations on the Jacksonville wage scale. About 300 men are employed at both mines, which have been idle for several months. When these mines resume a total of six mines in the eastern Ohio field will have resumed operation in the past two weeks.

Glouster Mine Again Idle.—Monsarrat Bros., operators of Columbus, have closed their mine near Glouster, which was opened for a few days late in August after a long idleness. The miners demanded that all of the former employees of the operation be given an equal share in the work, to which the company refused to accede. Then the men walked out and efforts to settle the trouble have been a failure. The mine has been closed indefinitely.

PENNSYLVANIA

Glen Alden Declares Dividend.—Directors of the Glen Alden Coal Co. last week declared a dividend of $2.50, payable Sept. 20 to stock of record Sept. 10. This dividend is at the annual rate of $10 established last June by payment of $5 for the first six months of this year. The previous annual rate had been $7 a share.

Dupont Miners on Contract Rate.—One hundred and fifty miners employed at the Florence colliery of the Lehigh & Wyoming Valley Coal Co. in Dupont are now working on a contract instead of a company basis as the result of a series of conferences between C. E. Banker, general manager of the company, and Michael Kosik, vice-president of District No. 1, United Mine Workers. The employees will now be paid at a rate of $6.50 per car. Working on the company basis the men were paid so much per day whether they loaded one, two or three cars. The men will profit materially under the new arrangement and the contract basis of payment will undoubtedly speed up production. William Miller has resigned as president of the Florence mine local. Victor Vellas is his successor.

Five Badly Hurt in Mine Blast.—Five men were seriously injured and several others slightly injured in an explosion at the Reliance shaft of the Philadelphia & Reading Coal & Iron Co., near Mount Carmel, at about 10 a.m., Sept. 2. A number of the workers had to leave the shaft because of shock. The workings of the mine were completely wrecked.

In an explosion of dynamite in the Lehigh Valley mine at Centralia Sept. 2, Richard Kane, sixty, was practically blown to pieces. He sustained a broken neck, dismembered arm and the entire front of his body was riddled by flying pieces of coal. Kane was tamping the dynamite in a hole when the explosion occurred.

Open-Shop Output Climbs. — High record for open-shop production was surpassed by the Pittsburgh Coal Co. in the week ended Aug. 28, when 73,332 tons was produced compared with previous high of 72,425 tons in the week ended Aug. 14.

VIRGINIA

Electrification to Speed Deliveries.—With the electrification of the Virginian Ry. between Roanoke, Va., and Princeton, W. Va., which is expected to be completed at an early date, the output of the coal mines in the McCoy district will be handled with such greater ease and dispatch that loaded cars will reach destinations in various parts of the state about forty-eight hours sooner than formerly. The transmission lines between Roanoke and Narrows have been energized, according to announcement by officials of the road at Roanoke.

Contract has been awarded for the erection of two office buildings for the Great Valley Coal Co. at McCoy.

Agree on Insurance Rates.—Operators in the Virginia field appear at last to have succeeded in obtaining satisfactory terms for compensation insurance coverage as a result of an agreement reached by representative operators and H. H. Rose, of Huntingdon, Pa., general manager of the American Mine Owners division of the Metropolitan Casualty Co. of New York after a committee had been working earnestly for a number of weeks to take care of the insurance problem. Some of the mines have been operating under a temporary insurance permit.

New Haulway Established After the Fire in West Virginia Coal & Coke Co. Mine

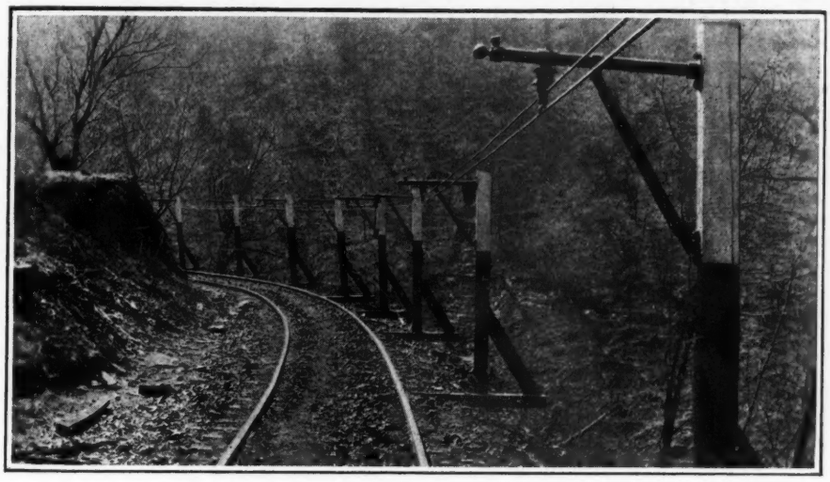
In No. 4 mine at Omar, W. Va., 110 acres are still sealed. The mine is in the Island Creek seam. Note the 500,000-circ.mil feeder suspended with "go-between" clamps on the same hangers as the trolley.

WEST VIRGINIA

Receiver for Two Companies.—In the Kanawha County common pleas court at Charleston, on Sept. 2, Lloyd B. Ramsey, of Charleston, was appointed receiver of the Blue Ridge and Export Coal companies, operating in southern West Virginia. The Blue Ridge Coal Co. was formerly the Brush Creek Coal Co., and its mine is located at Brush Creek, Boone County. According to the petition filed with the court, this plant can produce 1,000 tons of coal daily. The Export Coal Co. mine, which is located at Quinnimont, Fayette County, will be closed down and later sold, according to the petition. Some months ago the Blue Ridge, Export and Swiss By-Product coal companies were consolidated, and a new corporation, the Superior Fuels Co., was formed and chartered with capital stock of $2,500,-

000. The new concern failed to hold the properties, it is reported, because of some financial sprags in its program. It is said Ohio capital was interested in the new concern.

Bertha-Consumers Mines Expand.—In order to take care of growing demand the Bertha-Consumers Co. is making numerous improvements at two of its mines—the Eureka, at Randall, and the Rachel, near Mannington. The company has completed plans for the erection of a river tipple at the Eureka mine and has received a large consignment of mine cars, machines and locomotives at both mines. Both plants are now on a full-time basis. In July a total of 41,000 tons were produced at the Rachel mine and in August production was increased to 47,000 tons. It is believed that the output can be increased to 60,000 tons for October. The working force at the Rachel mine has been augmented by 100 additional men.



New Outside Haulway at West Virginia Coal & Coke Co.'s No. 4 Mine

Omar, Logan County, West Virginia. The new haulway was cut as a detour around the 110-acre fire area which is still sealed. Note the neat trolley construction and the 4/0 feeder suspended above the trolley by means of "go-between" clamps. The company has 35,000 of this style of clamp in use on feeder lines.

Clamor for Extension Courses.—Adam Crawford, assistant director of the mining extension department of West Virginia University, Morgantown, is making a two weeks' survey of southern West Virginia relative to placing mining extension classes for the coming year. The department is deluged with requests for classes. In the Kanawha-Fayette district 15 different mining towns want classes. The districts and the instructors for the coming year are as follows: Bramwell, C. C. Harth; Welch, C. G. Stout; Kanawha-Montgomery, J. E. Lentz; Morgantown, J. H. Haskell; Elkins, J. S. Poundstone; Mount Hope, Hobart Watson. Elkins district is the only new district in the state. Prof. C. E. Lawall, director of the mining extension department, it is reported, is studying the advisability of inaugurating a third year's work in the extension classes, although nothing definite has been done in the matter.

Williamson Operators to Meet.—Invitations are out for the meeting of the Operators' Association of the Williamson Field to be held at the Mountaineer Hotel Oct. 1 at Williamson. The Governor of West Virginia and many prominent folk in the operating end of the business are carded on the program prepared by Secretary George Bausewine, Jr.

Many Take Examinations.—Five hundred and five men took the mine foreman and fire boss examinations conducted in the last two months by the state Department of Mines, it was learned last week. The largest class to take the examination was at Welch, where there were 101. The number that took the examination in the other cities and towns were as follows: Morgantown, 76; Elkins, 30; Williamson, 32; Beckley, 86; Charleston, 73; Wheeling 46; Logan, 61.

No Appeal from Evictions.—The Supreme Court of Appeals of West Virginia recently refused to grant an appeal to the striking miners formerly employed at the plant of the Elm Grove Mining Co. at Elm Grove, Ohio County, who were ordered to quit the houses of the coal company. Writs of error were sought by John Hanas and Joseph Sipos, the defendants, who claimed that they had not obtained a fair trial because the summonses were not served legally. The appellate court decided that the order of repossession made by the Ohio County Circuit Court was regular and that the miners had received a fair trial.

Plan Extensive Improvements.—The Westchester Pocahontas Coal Co., of Chicago, plans extensive improvements at its newly acquired plant near Welch, which was formerly owned by the Wise Pocahontas Coal Co., of Hensley, McDowell County. New machinery will be installed so that the plant will produce from 15,000 to 20,000 tons a month within the next six months. Eventually it is planned to produce 25,000 tons monthly. There are 1,025 acres of Pocahontas coal land in the tract. J. E. Stearns, of Chicago, president of the company, was a recent visitor to the region.

Conveyor Line Tried Out.—The Webb Coal Mining Co. of Garrison, Boone County, has completed its new conveyor line, which was formally tested out last week. The conveyor line is 1,150 ft. long and starts from a point 600 ft. high. The plant has a capacity of 200 tons per hour. The conveyor line will not only increase the capacity of the plant but will permit the coal to move to the cars in a manner that will assure a larger proportion of lump than previously obtained at the plant.

WISCONSIN

To Boost Briquetting Capacity.—The Berwind Fuel Co. is pushing to completion the building of an addition to its briquetting plant at Superior. The improvements include a new conveyor, enlargement of bin capacity and additional equipment. The present capacity of the plant of from 800 to 1,000 tons daily will be materially increased.

Will Increase Coke Output.—Good progress is being made in completing improvements to the Zenith Furnace Co.'s coke-oven plant at Duluth. Officials of the company report that distribution from its plant this season will be substantially increased.

CANADA

Ontario to Get Alberta Coal at $11.—Premier G. Howard Ferguson announced this afternoon that Alberta coal to be retailed at a price not exceeding $11 per ton, all charges included, would be available for Ontario householders soon. Premier Ferguson stated that he had received the assistance of R. B. Bennett in arranging the shipment, the estimated tonnage of which is placed at 6,000. The first shipment is expected in a week or so. Definite arrangements regarding the distribution of the fuel have not yet been made, but it will be divided among various districts of the province.

June Output Exceeds Average.—Output of coal from Canadian mines during June totaled 1,387,040 tons as against 1,138,738 tons in May and an average of 944,942 tons for the month during the five preceding years. All the coal-producing provinces showed a gain in production over the preceding month, and the outputs of Nova Scotia, Alberta and British Columbia were greater than the averages for the month in the five preceding years. Coal imports in June amounted to 1,887,031 tons, as compared with 1,337,206 tons in May and the five-year average for June of 1,583,843 tons. Of the receipts of coal from Europe 44,044 tons came from Great Britain and 23,447 tons from Germany. The remainder, amounting to 1,842,987 tons, came from the United States. For the first six months of 1926 the total amount of coal imported into Canada was 7,221,924 tons, or 4 per cent below the preceding five-year average for the period. Exports of Canadian coal in June were 95,336 tons; May, 57,512 tons. Comparison of June exports with the preceding five-year average showed a decrease of 3 per cent. Total exports for the first six months of the calendar year amounted to 343,272 tons, or 45 per cent less than the five-year average.

Among the Coal Men

F. A. W. Lewin has resigned his position as assistant general superintendent of the Saint Louis Coal & Iron Co., to accept the eastern district managership of the Mancha Storage Battery Locomotive Co. of St. Louis. Mr. Lewin was associated with the operation of southern Illinois coal mines for a number of years. During the war he spent considerable time making physical and financial examinations of coal properties. When that work was completed he acted as a labor commissioner for the government in munition plants. Later he joined the Mancha company force, resigning after six years' service to go with the Saint Louis Coal & Iron Co.

Dever C. Ashmead

Formerly anthracite editor of *Coal Age* and engineer in charge of the Wilkes-Barre (Pa.) office of the U. S. Bureau of Mines, Mr. Ashmead has become vice-president of the Hydrotator Co., with offices in the Coal Exchange Building, Wilkes-Barre. Born in New York City, Aug. 11, 1884, he attended public school at Yonkers and later was graduated from Columbia University, School of Mines. Later he did consulting work in Maryland, West Virginia and Kentucky, and for three years was affiliated with Ford, Bacon & Davis. During the war he was construction engineer for the Y. M. C. A. in France. After that he accepted a position as a member of the *Coal Age* editorial staff, resigning to make a report on wastes and losses in the anthracite region for the U. S. Coal Commission. Under the auspices of the Bureau of Mines and the Water Power and Resources Board of the State of Pennsylvania he later made a report on silt production and disposal in the anthracite region. He also has written numerous technical articles.

There have been a number of promotions in the ranks of the operating officials of the Philadelphia & Reading Coal & Iron Corporation with the past few weeks. **F. C. Caldwell,** of the Shamokin division, has been appointed General Superintendent of the Shamokin-Mt. Carmel-Ashland and Shenandoah divisions. **E. C. Jones,** inside superintendent, Shamokin division, has been promoted to the position of division superintendent; **Leslie D. Lamont,** superintendent, St. Clair division, has been appointed assistant to E. E. Kaercher, general superintendent of the Tremont-Minersville-St. Clair-Mahanoy and St. Nicholas divisions; **George A. Roos,** superintendent, Wadesville colliery, has been promoted to the superintendency of the St. Clair division; **W. R. Plummer,** inside foreman, Bear Valley colliery, has been made inside superintendent of the Shamokin division; **A. J. Hauptly,** engineer, St. Clair division, has been appointed superintendent of the Wadesville colliery; **W. S. Zartman,** engineer, Shamokin division, has been made superintendent of the North Franklin colliery; **Leon Adams,** transitman, Shamokin division, and **A. S. Hamilton,** transitman, St. Clair division, have been promoted to division engineers. This list supersedes that published in *Coal Age*, Aug. 12, p. 230. The earlier list contained several typographical errors.

Traffic News

Cuts Rates to Hoopeston

Reductions of 5 to 45c. per ton in the rates on bituminous coal from mines in Indiana to Hoopeston, Ill., have been ordered by the Interstate Commerce Commission in its recent decision in *Iliff-Bruff Chemical Co. et al. vs. Chicago & Eastern Illinois Ry. Co. et al.*, 113 I.C.C. 606. Complainant attacked rates of $1.38 and $1.45 from Clinton and Coal Bluff, in the Brazil-Clinton group; $1.38 and $1.67 from Latta, Midland, Seifert, Riley, Paxton and Sullivan, in the Linton-Sullivan group; $1.45 and $1.75 from Petersburg and Oakland City in the Princeton group and $1.78 and $1.79 from Enos and Lincoln City, in the Princeton group. The Commission found that the rates should not exceed $1 from the Brazil-Clinton group points named, $1.20 from the Linton-Sullivan stations, $1.40 from Petersburg and Oakland City and $1.55 from Enos and Lincoln City.

Rate Cuts Deferred Pending I.C.C. Inquiry

A proposal to reduce coal rates to Cincinnati from principal West Virginia producing fields by 11c. per ton, which the Norfolk & Western and Chesapeake & Ohio railroads proposed to make effective Sept. 1, has been suspended by the Interstate Commerce Commission. The railroads were ordered to maintain existing schedules until December 30, pending a commission investigation.

Obituary

Peter Reiss, Noted Coal Shipper And Vessel Owner, Dies

Peter Reiss, president of the C. Reiss Coal Co., one of the largest distributing concerns in the Northwest, died at his home in Sheboygan, Wis., Sept. 5 after a long illness at the age of fifty-nine.

Peter Reiss

His untiring efforts were almost entirely responsible for the building up of the C. Reiss Coal Co., which to-day is one of the outstanding organizations in the Northwest. The company operates docks at a number of Lake Michigan ports and at the Head of the Lakes. Mr. Reiss had been president of the Reiss Steamship Co. since its formation until about a year ago, when he resigned in favor of his brother, W. A. Reiss. He remained a director of the company, however, and also was president of the Rockport Steamship Co. and of the Northern Furniture Co.

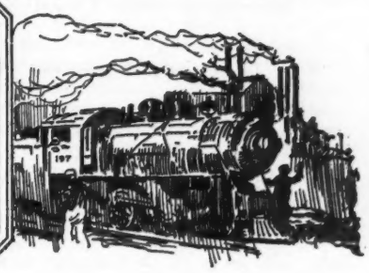
He was noted for philanthropic activities and his keen business judgment and integrity caused him to be held in high esteem by those who had dealings with him.

Willis G. Reynolds, who for many years had been associated with the West Kentucky Coal Co. at Sturgis, Ky., is dead after a short illness. He was born in Blackford, Ky., in 1879 and he was widely known in the coal trade in western and northern Kentucky.

Ralph Crews, general counsel and a director of the Old Ben Coal Corporation, formerly connected with a well-known Chicago law firm and for the last three years a member of the firm of Shearman & Sterling, New York attorneys, was instantly killed in an automobile accident in New York on Sept. 6, Born in Mount Vernon, Ill., in 1887, Mr. Crews spent most of his life in Chicago, where he became prominent in business and civic affairs. He also was general counsel for the Consolidation Coal Co.

Charles M. Jamison, secretary of the Jamison Coal & Coke Co., at Greensburg, Pa., died on Sept. 6. He leaves seven brothers.

Production And the Market



Advances in Soft-Coal Prices Forces Spot Index To Highest Level Since February

Further advances in spot quotations on many of the principal grades marked the course of the bituminous coal markets of the country during the second week of September. These increases, far exceeding in number and intensity the decreases in open-market prices on some other sizes, carried *Coal Age* Index of spot bituminous prices for Sept. 13 to 176, with a corresponding weighted average price of $2.13. This was not only an increase of five points and 6c. over Sept. 4 but was the highest level reached since last February.

The levels attained at that time were due to the extraordinary Eastern buying of bituminous coal for domestic purposes to replace anthracite cut off by the hard-coal strike. The exciting cause in the present advance, which started last July, has been the overseas movement of coal to Great Britain. Localized at first in West Virginia, the influence has now spread out over the wide area lying between the Atlantic Ocean and the Mississippi River. It has been strengthened in the past few weeks by the normal seasonal advances on Middle Western prepared sizes.

Steam Sizes Suffer

The most conspicuous laggards in this march have been the smaller steam sizes of coal, particularly in the Middle West. Concessions have been made on the highest grade, as well as less desirable, Illinois and Indiana screenings to effect prompt disposition. West Virginia steam and gas mine-run also have wobbled, while Pittsburgh screened gas and slack have moved upward again. The past week also witnessed an appreciation in Baltimore pool coal prices after weeks of little fluctuation in the range.

As indicated in the preceding issue, bituminous output the first week of the month showed little decline from the record for the last week in August. For the week ended Sept. 4 the total was estimated by the U. S. Bureau of Mines at 11,002,000 net tons. Labor Day cut sharply into the loadings last week. With one exception, however, Tuesday loadings were the heaviest in several weeks.

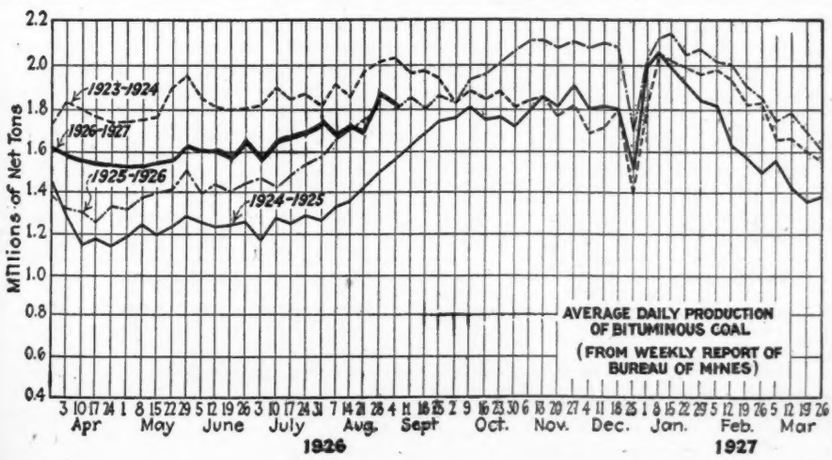
Lake Dumpings Decline

Dumpings of bituminous coal at the lower lake ports for transshipment showed another drop for the week ended Sept. 12, when the total was 683,881 tons of cargo and 40,645 tons of vessel fuel, or 53,387 tons less than in the preceding non-holiday week. The season's total to date, however, is 19,929,396 tons, as against 17,909,997 tons last year and 15,389,585 tons in 1924. In 1923 the total to Sept. 13 was 21,553,787 tons.

There is a more optimistic tone in the leading anthracite markets. The circular prices of the major producing companies are well maintained. Spot quotations on independent tonnage in New York harbor showed an increase of 10c. in the top figures on egg and nut. The latter size, however, was a problem for shippers to the Philadelphia market and some quiet concessions were made to move tonnage. Pea was easy, but not draggy.

The most cheering feature at this time, however, is the improvement which has taken place in the steam division. Less coal is going into company storage and there are fewer sacrifice sales of rice and barley by independent shippers. A surplus of buckwheat still embarrasses some of the smaller producers and sharper concessions are made to move this size promptly.

The Connellsville coke market took a surprising turn last week when the pre-holiday advances in spot prices were not only maintained but exceeded. A broader outlet for raw coal is the explanation given.



Estimates of Production

(Net Tons)

	1925	1926
BITUMINOUS		
Aug. 21	10,522,000	10,533,000
Aug. 28 (a)	11,133,000	11,217,000
Sept. 4 (b)	10,827,000	11,002,000
Daily average	1,805,000	1,834,000
Cal. yr. to date (c)	326,125,000	364,510,000
Daily av. to date	1,559,000	1,742,000
ANTHRACITE		
Aug. 21	2,155,000	1,782,000
Aug. 28	2,263,000	1,999,000
Sept. 4 (b)	434,000	1,951,000
Cal. yr. to date (c)	61,228,000	54,194,000
BEEHIVE COKE		
Aug. 28 (a)	166,000	181,000
Sept. 4 (b)	166,000	185,000
Cal. yr. to date (c)	6,532,000	8,284,000

(a) Revised since last report. (b) Subject to revision. (c) Adjusted to equalize number of days in the two years.

Midwestern Trade Unsettled

Lines of cleavage between sizes and between producing districts are becoming more marked in Middle Western trade centers. The larger domestic sizes from southern Illinois and Fourth Vein Indiana mines are moving at a good rate. Mt. Olive operators are asking more money from the retailers. Central Illinois and Fifth Vein producers, on the other hand, struggle to hold their own in the domestic field and the Standard group has reduced prices.

Steam sizes in all Illinois and Indiana districts are weak. Open and private concessions to move the surplus tonnage created by the increased movement of the domestic sizes from mines running throughout the summer and the output from operations which are starting up again are common. No. 1 and 2 nut also are heavy. In a measure this situation is offsetting the gains of the expanded domestic buying. The backing up of the smaller sizes is curtailing operations in the Duquoin-Jackson area. Railroad storage buying is helping Mt. Olive.

The story of Eastern coals in the Chicago market is a tale of steadily rising prices which shippers can make effective because of demands at tidewater and elsewhere. Smokeless lump is offered at $4.75@$5, with buyers reluctant to pay those figures. Spot mine-run at $2.75 finds little favor. Eastern Kentucky prices are under some moral restraint for the time being, but shippers decline to book large orders, anticipating that Oct. 1 will make another increase possible. Western Kentucky prices show greater stability than for many months past.

St. Louis Domestic Demand Easier

Following the heavier buying of a fortnight ago, domestic demand at St. Louis is flattening out. There is little call for either Standard or Mt. Olive, but southern Illinois and western Kentucky still move at a fairly good rate. Country demand for medium grade coals holds up. Eastern high volatiles also are finding a good market in trans-Mississippi River territory. St. Louis retail prices are $7 on southern Illinois, $5.75 on Mt. Olive, $5.50 on Standard, $16@$16.75 on large anthracite, $10 on smokeless and $10.50@$11.50 on coke.

Kentucky production is increasing and prices are following the same course. Mines in the western part of the state are doing slightly better than 50 per cent. In the eastern section, mines on the Big Sandy side have been shipping some coal to tidewater for export. The Harlan, Hazard and Elkhorn districts have been booked heavily with lake business. Taken as a whole, activity is more pronounced in the eastern than in the western section of the state.

Retail demand is strong and industrial consumption of fuel is encouraging. Eastern Kentucky block is held at $2.50@$3, with some special grades at $3.25; nut, lump and egg, $2@$2.50; mine-run, $1.50@$1.85; slack, $1.10@

Current Quotations—Spot Prices, Bituminous Coal—Net Tons, F.O.B. Mines

Low-Volatile, Eastern	Market Quoted	Sept. 14 1925	Aug. 30 1926	Sept. 4 1926	Sept. 13 1926†
Smokeless lump	Columbus	$4.75	$4.25	$4.35	$4.25@$4.50
Smokeless mine run	Columbus	2.55	2.25	2.30	2.15@ 2.50
Smokeless screenings	Columbus	1.50	1.40	1.40	1.35@ 1.50
Smokeless lump	Chicago	4.75	4.35	4.35	**4.50@ 5.00**
Smokeless mine run	Chicago	2.60	2.35	2.35	**2.50@ 2.75**
Smokeless lump	Cincinnati	5.00	4.10	4.35	**4.50@ 4.75**
Smokeless mine run	Cincinnati	2.60	2.35	2.50	**2.75**
Smokeless screenings	Cincinnati	2.00	1.60	1.85	1.75@ 2.00
*Smokeless mine run	Boston	5.50	5.40	5.40	*5.35@ 5.40*
Clearfield mine run	Boston	1.85	1.85	1.85	**2.00@ 2.25**
Cambria mine run	Boston	2.10	2.05	2.05	**2.00@ 2.50**
Somerset mine run	Boston	2.00	1.95	1.95	1.90@ 2.00
Pool 1 (Navy Standard)	New York	2.85	2.55	2.55	2.40@ 2.75
Pool 1 (Navy Standard)	Philadelphia	2.65	2.65	2.65	2.50@ 2.80
Pool 1 (Navy Standard)	Baltimore	2.30	2.15	2.15	**2.15@ 2.25**
Pool 9 (Super. Low Vol.)	New York	2.15	2.05	2.05	1.90@ 2.25
Pool 9 (Super. Low Vol.)	Philadelphia	1.95	2.10	2.10	2.00@ 2.25
Pool 9 (Super. Low Vol.)	Baltimore	2.05	1.85	1.85	**1.90@ 2.00**
Pool 10 (H.Gr.Low Vol.)	New York	2.00	1.85	1.85	1.75@ 2.00
Pool 10 (H.Gr.Low Vol.)	Philadelphia	1.85	1.85	1.85	1.75@ 2.00
Pool 10 (H.Gr.Low Vol.)	Baltimore	1.90	1.55	1.55	**1.80@ 1.85**
Pool 11 (Low Vol.)	New York	1.80	1.65	1.65	1.55@ 1.80
Pool 11 (Low Vol.)	Philadelphia	1.70	1.55	1.55	1.45@ 1.70
Pool 11 (Low Vol.)	Baltimore	1.70	1.55	1.55	**1.75@ 1.80**
High-Volatile, Eastern					
Pool 54-64 (Gas and St.)	New York	1.55	1.40	1.40	**1.40@ 1.55**
Pool 54-64 (Gas and St.)	Philadelphia	1.60	1.45	1.55	1.45@ 1.65
Pool 54-64 (Gas and St.)	Baltimore	1.65	1.55	1.55	**1.65@ 1.75**
Pittsburgh sc'd gas	Pittsburgh	2.50	2.30	2.30	**2.35@ 2.50**
Pittsburgh gas mine run	Pittsburgh	2.15	2.10	2.10	2.00@ 2.20
Pittsburgh mine run (St.)	Pittsburgh	2.05	2.00	2.00	1.90@ 2.10
Pittsburgh slack (Gas)	Pittsburgh	1.55	1.20	1.20	**1.30@ 1.40**
Kanawha lump	Columbus	2.60	2.50	2.50	2.25@ 2.75
Kanawha mine run	Columbus	1.70	1.60	1.70	1.60@ 1.85
Kanawha screenings	Columbus	1.30	1.15	1.15	1.10@ 1.25
W. Va. lump	Cincinnati	2.75	2.35	2.75	2.50@ 3.00
W. Va. gas mine run	Cincinnati	1.65	1.75	1.85	*1.75@ 1.85*
W. Va. steam mine run	Cincinnati	1.50	1.55	1.70	1.65@ 1.75
W. Va. screenings	Cincinnati	1.15	1.35	1.30	*1.15@ 1.35*
Hocking lump	Columbus	2.75	2.40	2.40	2.35@ 2.50
Hocking mine run	Columbus	1.65	1.55	1.55	1.40@ 1.75
Hocking screenings	Columbus	1.40	1.20	1.20	1.15@ 1.25
Pitts. No. 8 lump	Cleveland	2.35	2.15	2.15	1.80@ 2.50
Pitts. No. 8 mine run	Cleveland	1.85	1.75	1.70	1.70@ 1.75
Pitts. No. 8 screenings	Cleveland	1.45	1.25	1.20	1.20@ 1.25

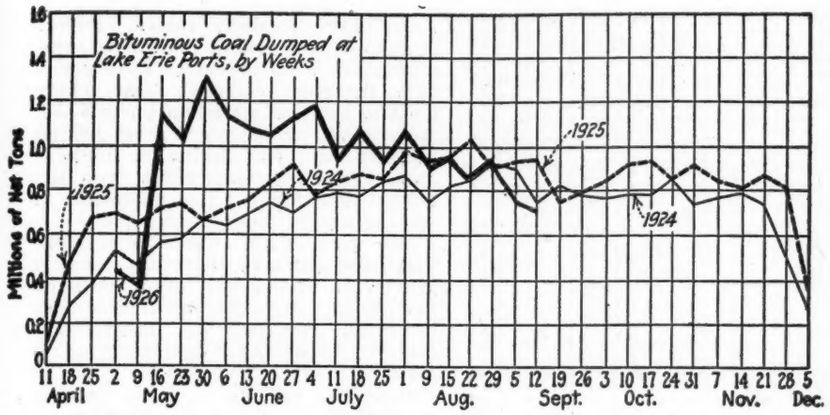
Midwest	Market Quoted	Sept. 14 1925	Aug. 30 1926	Sept. 4 1926	Sept. 13 1926†
Franklin, Ill. lump	Chicago	$3.25	$3.00	$3.10	**$3.25**
Franklin, Ill. mine run	Chicago	2.35	2.40	2.40	2.35@ 2.50
Franklin, Ill. screenings	Chicago	1.60	1.60	1.55	1.30@ 1.85
Central, Ill. lump	Chicago	2.85	2.60	2.75	*2.50@ 2.75*
Central, Ill. mine run	Chicago	2.10	2.20	2.20	2.15@ 2.25
Central, Ill. screenings	Chicago	1.55	1.50	1.50	*1.30@ 1.50*
Ind. 4th Vein lump	Chicago	3.10	2.60	2.75	**2.75@ 3.00**
Ind. 4th Vein mine run	Chicago	2.35	2.25	2.25	2.15@ 2.35
Ind. 4th Vein screenings	Chicago	1.60	1.60	1.50	*1.30@ 1.60*
Ind. 5th Vein lump	Chicago	2.35	2.35	2.35	**2.25@ 2.60**
Ind. 5th Vein mine run	Chicago	1.95	2.00	2.00	1.90@ 2.10
Ind. 5th Vein screenings	Chicago	1.20	1.35	1.35	*1.25@ 1.40*
Mt. Olive lump	St. Louis	2.50	2.35	2.35	**2.50@ 2.75**
Mt. Olive mine run	St. Louis	2.00	2.15	2.15	**2.25**
Mt. Olive screenings	St. Louis	1.75	1.55	1.55	1.50@ 1.60
Standard lump	St. Louis	2.25	2.25	2.25	*2.10@ 2.25*
Standard mine run	St. Louis	1.80	1.80	1.80	1.75@ 1.85
Standard screenings	St. Louis	1.15	1.35	1.35	*1.00@ 1.25*
West Ky. block	Louisville	2.10	1.80	1.90	1.85@ 2.00
West Ky. mine run	Louisville	1.35	1.20	1.25	1.10@ 1.40
West Ky. screenings	Louisville	.75	.85	.85	.75@ .95
West Ky. block	Chicago	2.30	1.60	1.60	**1.50@ 2.00**
West Ky. mine run	Chicago	1.25	1.10	1.10	**1.00@ 1.35**
South and Southwest					
Big Seam lump	Birmingham	2.25	2.25	2.25	2.00@ 2.50
Big Seam mine run	Birmingham	1.75	1.85	1.85	1.75@ 2.00
Big Seam (washed)	Birmingham	1.85	2.00	2.00	1.75@ 2.25
S. E. Ky. block	Chicago	3.00	2.60	2.60	2.50@ 2.75
S. E. Ky. mine run	Chicago	1.95	1.75	1.75	1.60@ 1.90
S. E. Ky. block	Louisville	3.00	2.50	2.75	2.50@ 3.00
S. E. Ky. mine run	Louisville	1.60	1.65	1.65	1.50@ 1.85
S. E. Ky. screenings	Louisville	1.25	1.05	1.15	1.10@ 1.25
S. E. Ky. block	Cincinnati	3.00	2.35	2.60	**2.75@ 3.00**
S. E. Ky. mine run	Cincinnati	1.55	1.45	1.75	1.65@ 1.85
S. E. Ky. screenings	Cincinnati	1.15	1.05	1.30	*1.15@ 1.40*
Kansas lump	Kansas City	4.35	4.35	4.35	**4.50@ 4.75**
Kansas mine run	Kansas City	3.10	3.00	3.00	3.00
Kansas screenings	Kansas City	2.50	2.35	2.35	2.35

* Gross tons, f.o.b. vessel, Hampton Roads
† Advances over previous week shown in **heavy type**, declines in *italics*

Current Quotations—Spot Prices, Anthracite—Gross Tons, F.O.B. Mines

	Market Quoted	Freight Rates	Sept. 14, 1925 Independent	Sept. 14, 1925 Company	Sept. 4, 1926 Independent	Sept. 4, 1926 Company	Sept. 13, 1926† Independent	Sept. 13, 1926† Company
Broken	New York	$2.34	.....	$8.20@$8.95	.....	$8.50@$9.25	.....	$8.50@$9.25
Broken	Philadelphia	2.39	.....	.....	$9.25	8.50@ 9.15	$9.25	8.50@ 9.15
Egg	New York	2.34	$13.00@14.00	8.65@ 8.90	8.75@ 9.10	8.75@ 9.25	**8.75@ 9.20**	8.75@ 9.25
Egg	Philadelphia	2.39	.....	.....	9.00@ 9.75	9.00@ 9.15	9.00@ 9.75	9.00@ 9.15
Egg	Chicago*	5.06	8.17@ 8.60	8.03@ 8.28	8.14	8.13	8.14	8.13
Stove	New York	2.34	13.00@14.00	9.15@ 9.40	9.25@ 9.60	9.25@ 9.50	9.25@ 9.60	9.25@ 9.50
Stove	Philadelphia	2.39	.....	.....	9.15@10.20	9.35@ 9.50	9.15@ 10.20	9.35@ 9.50
Stove	Chicago*	5.06	10.00@11.00	8.48@ 8.80	8.59	8.33@ 8.58	8.59	8.33@ 8.58
Chestnut	New York	2.34	13.00@14.00	8.65@ 8.90	8.75@ 9.10	8.75@ 9.15	**8.75@ 9.20**	8.75@ 9.15
Chestnut	Philadelphia	2.39	.....	.....	8.50@ 9.75	9.00@ 9.15	8.50@ 9.75	9.00@ 9.15
Chestnut	Chicago*	5.06	10.00@11.00	8.28@ 8.50	8.39	8.33@ 8.53	8.39	8.33@ 8.53
Pea	New York	2.22	6.00@ 7.00	5.00@ 6.00	6.00@ 6.50	6.00@ 6.50	6.00@ 6.50	6.00@ 6.50
Pea	Philadelphia	2.14	.....	5.00@ 6.00	6.00@ 6.75	6.00@ 6.50	6.00@ 6.75	6.00@ 6.50
Pea	Chicago*	4.79	5.25@ 5.75	5.05@ 5.36	6.03	6.10	6.03	6.10
Buckwheat No. 1	New York	2.22	2.60@ 3.00	2.50	1.85@ 2.35	3.00@ 3.50	**1.90@ 2.35**	3.00@ 3.50
Buckwheat No. 1	Philadelphia	2.14	.....	2.50	1.85@ 2.50	2.25@ 2.75	1.85@ 2.50	2.25@ 2.75
Rice	New York	2.22	.....	2.00	1.50@ 1.85	2.00@ 2.25	**1.90@ 2.00**	2.00@ 2.25
Rice	Philadelphia	2.14	.....	2.25	1.30@ 2.00	1.75@ 2.25	1.30@ 2.00	1.75@ 2.25
Barley	New York	2.22	.....	1.50	1.25@ 1.50	1.75@ 2.25	1.25@ 1.50	1.75@ 2.25
Barley	Philadelphia	2.14	.....	1.50	1.25@ 1.75	1.50@ 1.75	1.25@ 1.75	1.50@ 1.75
Birdseye	New York	2.22	.....	1.60	1.25@ 1.50	2.00	**1.60**	2.00

* Net tons, f.o.b. mines. † Advances over previous week shown in **heavy type**, declines in *italics*.



$1.25. Western Kentucky 6-in. block commands $1.85@$2; lump and egg, $1.60@$1.85; nut, $1.45@$1.65; mine-run, $1.10@$1.40; screenings, 75@95c.

Dock Movement Active

The impetus given buying at the Head of the Lakes by the approach of the fall season is undiminished. During August 18,306 cars were shipped off the docks, as against 16,223 cars in July and 20,778 cars in August, 1925. Barring a slump, of which no signs appear, September totals will exceed last month's figures. Receipts from the lower ports are characterized as satisfactory. In fact, the slowing down in the run from the Lake Erie ports has helped Duluth and Superior to reduce congestion and accumulations.

A touch of colder weather a few days ago caught many dealers and consumers unprepared. Rush orders flowed into the dock offices from the retail trade. Industrial demand from southern Minnesota and the Twin Cities also was cheering. Reports of operating schedules planned on the iron ranges convince the dock men that consumption in that field will be large. The foretaste of winter stimulated greater interest in anthracite and shippers now look forward to a normal trade in hard coal. Aside from a cut of 25c. in buckwheat at one of the docks, prices are unchanged. In the bituminous list, Kentucky screenings have advanced to $4 and $4.25 now rules on Youghiogheny slack.

Conditions in the Twin Cities market are improving. There is more consumer buying of domestic coal. The outlook industrially also is brighter. Both dock and all-rail quotations are firmly held. Domestic demand at Milwaukee is slower than normal for this season of the year although there has been no actual weakening in the position of the trade. Pocahontas is very active and offerings are limited. Anthracite is picking up, but it does not enjoy the wide distribution of pre-strike days.

Kansas Demand Broadens

Increased buying by the retail trade and a broader outlet for screenings had a tonic effect upon the Kansas market last week. Prices on domestic coal were advanced another 25c., Cherokee deep-shaft lump selling at $4.50@$4.75. Many producers reported that they are behind on orders. In the Arkansas field the situation is mixed; most of the mines in the Paris and Spadra districts are running only part time, but a few Arkansas operations appear to be working to capacity. The Oklahoma situations is unchanged.

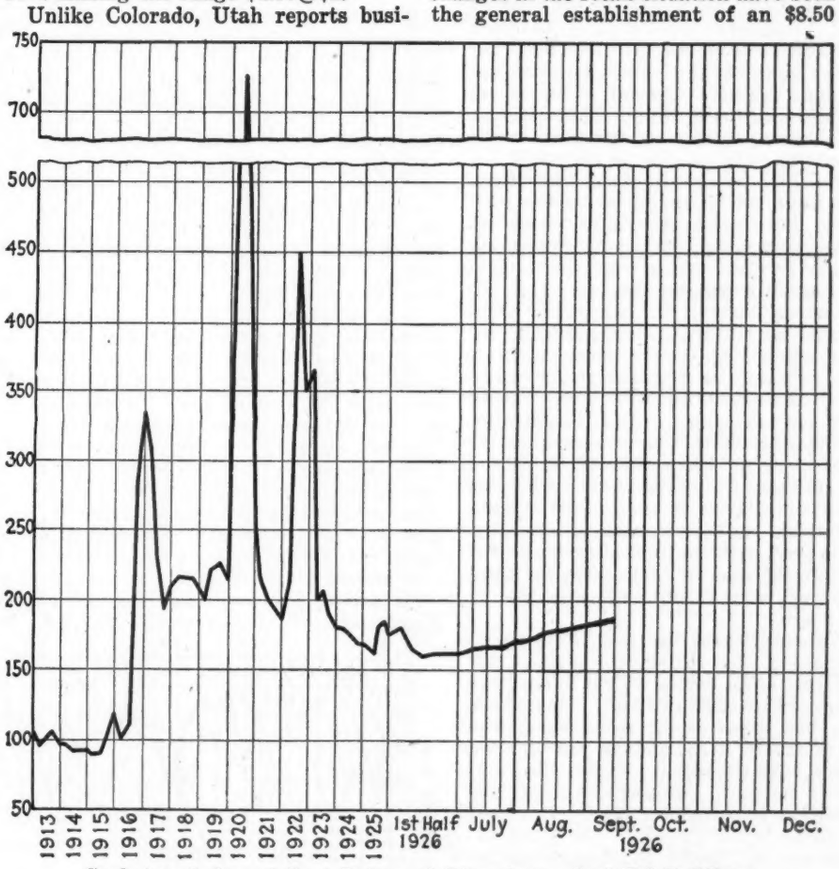
The advance of 50c. in lump and nut prices on Sept. 1 has not checked the domestic buying of Colorado coals. On the contrary, cooler weather and late rains over Kansas and Nebraska have swelled the demand. Slack, too, is moving in satisfactory volume. Increases in prices on Kemmerer-Rock Springs coals bring lump to $4.50 and grate and nut to $4, advances of 75 and 50c., respectively. Slack is up 25 to 30c., making the range $1.50@$2.

Unlike Colorado, Utah reports business on a descending scale. Mines are operating about three days a week and the producers are wondering how long that basis can be maintained. "No bills" are increasing. Demand in all directions appears quiet. Slack is easy, but an immediate tightening is expected if the rate of production declines. Retail business at Salt Lake City has been more active because of weather conditions.

No Top in Cincinnati Market

The upward swing in prices in the Cincinnati market still is unchecked. Gas mine-run and high-volatile steam slack are softer, but the declines there have been wiped out by further increases in lump quotations and in advances in the low-volatile list. First-grade eastern Kentucky block last week sold at $2.75@$3, with up to $4 paid for fancy Elkhorn and Jellico lump. Screenings weakened a little under heavy production. West Virginia block was held at $2.50@$3, the low price on 4-in. coal being fixed by some of the Logan County interests.

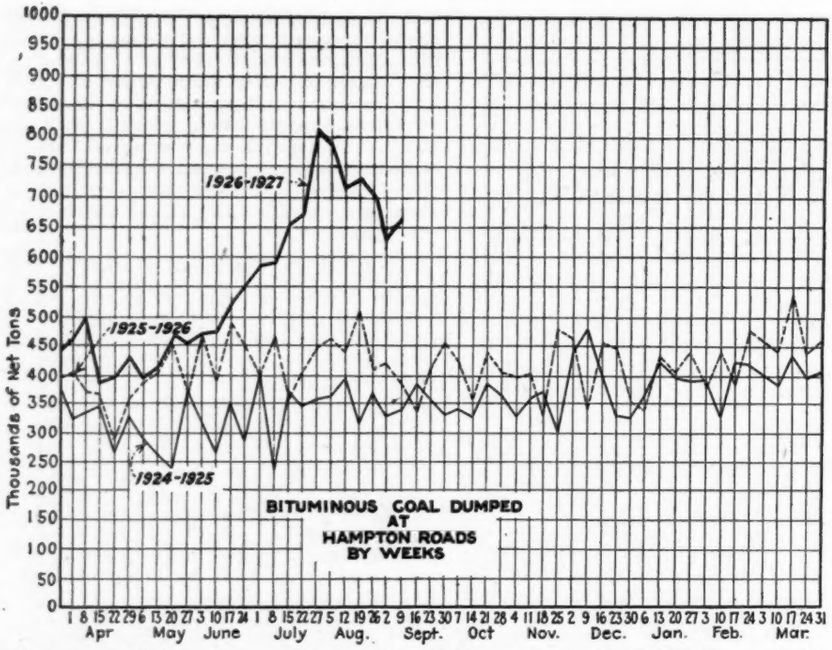
In the smokeless division as high as $4.75 has been paid for lump and egg, but $4.50 is the ruling quotation. Mine-run has been forced up to $2.75, with little free coal to be had at that figure. Slack, too, has risen under heavier buying by the byproduct ovens. Locally, the only changes in the retail situation have been the general establishment of an $8.50



Coal Age Index of Spot Prices of Bituminous Coal F.O.B. Mines

	1926				1925	1924
	Sept. 13	Sept. 4	Aug. 30	Aug. 23	Sept. 14	Sept. 15
Index	176	171	168	165	178	167
Weighted average price	$2.13	$2.07	$2.04	$2.00	$2.16	$2.02

This diagram shows the relative, not the actual, prices on fourteen coals, representative of nearly 90 per cent of the bituminous output of the United States, weighed first wtih respect to the proportions each of slack, prepared and run-of-mine normally shipped, and second, with respect to the tonnage of each normally produced. The average thus obtained was compared with the average for the twelve months ended June, 1914, as 100, after the manner adopted in the report on "Prices of Coal and Coke: 1913-1918," published by the Geological Survey and the War Industries Board.


1926-1927
1925-1926
1924-1925
BITUMINOUS COAL DUMPED AT HAMPTON ROADS BY WEEKS
Thousands of Net Tons
Apr May June July Aug. Sept. Oct Nov. Dec. Jan. Feb. Mar.

price on smokeless lump and an advance to $4.25 for bituminous slack by a number of retail distributors.

Domestic Orders Swamp Columbus

Domestic buying in central and southern Ohio has reached such proportions that producers are refusing to book new orders from the retailers until the mines have caught up on some of the tonnage already placed. The steam trade, however, continues backward, as big buyers show no particular desire to accumulate stocks or to build up diminishing reserves. Prices are firm. The most active buying is by the utilities. Lake tonnage can be placed at prices 50c. over the levels prevailing earlier in the season. Southern Ohio production is gaining slightly.

The situation in northern Ohio showed no material change during the past week. Spot quotations on No. 8 coal held at the reduced levels established the preceding week and demand was not pressing. Spot Pocahontas, on the other hand, was extremely active and prices on lump shot to $4.50 and $5. Eastern Ohio production during the week ended Sept. 4 approximated 242,000 tons, or 35 per cent of capacity. Compared with the preceding week this was an increase of 1,000 tons; the total however, was 24,000 tons less than a year ago.

Although there has been less export buying in the Pittsburgh district the last few days, prices on gas lump have advanced to $2.35@$2.50. Gas slack, too, has appreciated; sales have been made freely at $1.35 and the general range is $1.30@$1.40. Steam slack has shown no gain. Buying for retail distribution is growing. There is report of some labor unrest in the Connellsville region. In the Pittsburgh district proper few independent producers feel the time propititious to follow the lead of the Pittsburgh Coal Co. in open-shop operation.

Pennsylvania Prices Easier

Prices on central Pennsylvania pool coals declined 10 to 15c. last week. Pool 1 was offered at $2.50@$2.80; pool 71, $2.30@$2.50; pool 9, $2.15@$2.25; pool 10, $1.85@$2.15; pool 11, $1.65@$1.70, and pool 18, $1.55@$1.60. Production is larger and more coal has been shipped to Philadelphia than for several years. Several operators are reported to have contracted their output for the rest of the coal year.

The Buffalo bituminous market shows little which looks like improvement. Aside from an increase of 5c. in the top quotation on Youghiogheny gas slack and a nickel pick-up in Pittsburgh and No. 8 steam slack, current quotations on high-volatile coals are unchanged. The present range on low-volatile prices has cut down local buying. Toronto reports a better demand for bituminous coal, with no change in prices. Retailers have advanced anthracite prices 25c.

New England industrial consumers came into the market last week only when compelled to by immediate necessities. These in the aggregate were not large. Efforts of some shippers to peg the Boston on-car price for West Virginia smokeless at $6.75 met with little sucess as tonnage was readily obtainable for reasonably prompt shipment at $6.60@$6.65. Competition for business at Providence established a range of $6.40@$6.75, with excellent coal offered at $6.50.

Quotations on Navy Standard coal at Hampton Roads for New England delivery were decidedly easier. Buyers in a position to accept immediate shipment could place orders at $5.40 gross, f.o.b. the piers, although some sellers tried to hold the minimum up to $5.50. A fortnight ago shippers were asking $5.60@$5.65. The decline on southern coals had a softening effect upon the all-rail situation, but spot quotations in some instances were stronger.

The New York outlook was more optimistic although there has been no great rush of business. For the most part, buyers are confining their orders to current requirements. These, however, are expanding. The heavier movement of central Pennsylvania coals to Philadelphia and Baltimore is slowing up deliveries to this port. There is no large surplus of free coal at the piers. Many shippers decline to send coal forward unless assured of its prompt sale.

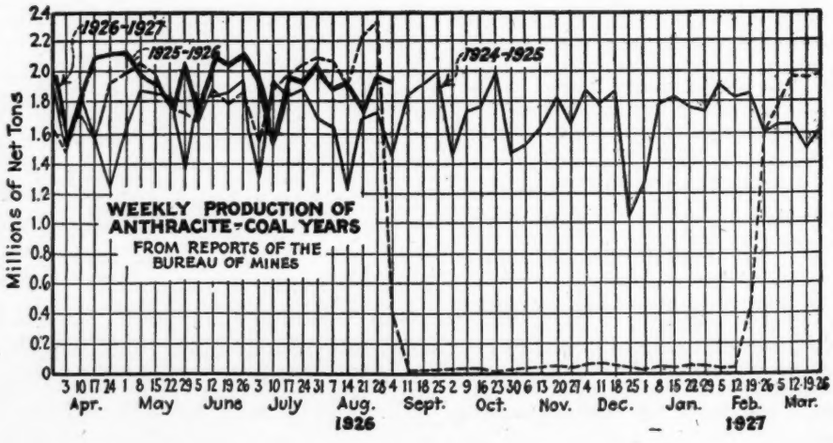
At Philadelphia demand for high-grade bituminous continues to rise and here and there this increase is reflected in slightly higher prices. This latter development, however, is the exception rather than the rule. Increased shipments of prepared coal have enlarged the tonnage of slack offered, but the surplus is readily absorbed. Cement mills are storing this coal for winter needs. Tidewater trade is active.

Hope to Smash Record

Baltimore shippers are hoping that September exports will exceed last month's totals, which smashed all previous records. Clearances the first few days this month were at the rate of about 200,000 tons per week. Notwithstanding this heavy movement, buyers for home consumption show no concern as to future supplies. Current quotations, however, are on a higher basis.

On the whole the situation in the Birmingham market may best be described as one of "marking time." Improvement in actual buying has been slight. Most of the betterment noted has been confined to the high-grade coals, with washed fuel in the lead. The spot coke market is showing more strength. Surplus supplies have been cleaned up and an advance from the present $6 on spot and $5.50 on contract coke is not unlikely. Sales for domestic consumption are gratifying.

The anthracite market at New York is stronger in all departments. Steam sizes are in better demand than for several months. Rice and barley are extremely short on some roads and there has been a sharp reduction in the



Car Loadings and Supply

	Cars Loaded—All Cars	Cars Loaded—Coal Cars
Week ended Sept. 4, 1926.....	1,151,346	197,877
Week ended Aug. 28, 1926.....	1,136,233	201,159
Week ended Sept. 5, 1925.....	1,102 946	178,218
Week ended Aug. 29, 1925.....	1,124,436	211,683

	Surplus Cars—All Cars	Surplus Cars—Coal Cars	Car Shortages—All Cars	Car Shortages—Coal Cars
Aug. 22, 1926.	168,884	38,813	.....	.....
Aug. 14, 1926.	171,269	40,700	.....	.....
Aug. 14, 1925.	217,190	62,058	.....	.....

tonnage of barley and birdseye seeking a market. Demand for domestic sizes has reached a point where some of the smaller shippers are able to get top prices for their offerings.

Philadelphia Anthracite Stronger

Philadelphia, too, finds the hard-coal market in a better position. In the domestic division of the trade, although retailers are ordering more freely, nut coal still bothers some of the shippers. Quiet sales of independent nut at less than established circular prices are resorted to to keep tracks clear. Stove, on the other hand, is strong. Pea is easy. The steam sizes retain their recent gains and less coal is going into storage. There still is a surplus of No. 1 buckwheat, however, which must be sold at a sacrifice.

With yard stocks large enough to take care of current demands, Baltimore is viewing the anthracite situation with wonted calm. Movement at Boston is seasonable, but retailers with good company connections show no interest in spot tonnage at premium prices. Improvement in local hard-coal demand at Buffalo is slow. Lake dumpings continue to decline. During the week ended Sept. 4 dumpings totaled only 30,000 tons, of which 16,000 tons were cleared for Duluth and Superior and 14,000 tons for Milwaukee.

Connellsville Coke Stronger

Pre-holiday buying of coke in anticipation of shutdowns sent the spot market on furnace coke in the Connellsville region to $3.25. This figure has been exceeded since and the current range is $3.25@$3.35, with rumors of some sales at $3.50. Spot foundry coke remains $4@$4.50. Heavier shipments of raw coal, including gas fuel for export, are primarily responsible for the stronger market in coke.

During the week ended Sept. 4 coke production in the Connellsville and Lower Connellsville Region increased to 132,980 tons, according to the Connellsville *Courier*. Furnace-oven output was 69,000 tons, a decrease of 1,000 tons when compared with the preceding week. Merchant-oven output was 63,980 tons, an increase of 3,670 tons.

Utility Coal Consumption Up; Water Power Declines

Public-utility power plants in the United States consumed 3,339,198 net tons of coal in July, 1926, according to the U. S. Geological Survey. This compares with 3,168,277 tons in the preceding month. Fuel oil consumed by these plants in July totaled 699,917 barrels, against 624,834 barrels in June.

The average daily production of electricity by public-utility power plants in the United States in July was 190,350,000 kw.-hr., about 3 per cent less than the average daily output for June.

There was an unprecedented decrease in the average daily production of electricity by the use of water power from June to July of about 14 per cent. This unusual decrease was due to continued low rainfall throughout practically the entire country, which was the cause of abnormally low flow in the streams used for power purposes. The extensive rainfall in the eastern portion of the country during August has, to some extent, relieved drought conditions. Ground water has been depleted, owing to the two seasons of low precipitation and additional rains are needed to restore the streams to normal flow.

Shipments of coal west bound through the "Soo" Canals during August included 1,806,377 net tons of bituminous and 322,066 tons of anthracite.

Rice Compiles Handbook on Safety in Coal Mining

In order to make available in concise and convenient form a statement of the safety practices and methods recommended by the Bureau of Mines a "Handbook on Safety in Coal Mining" has been prepared by George S. Rice, chairman of the Bureau's Mine Safety Board.

While engaged in the practice of mining engineering Scott Turner, director of the Bureau, was impressed with the need for such a work. One of his first requests on becoming director was that this handbook be prepared. He expresses his conception of the need for the book as follows:

"The rapidly increasing use of machinery for cutting and loading coal, longer haulageways and the increased use of mechanical haulage equipment have contributed toward economy in mining by making possible a larger production of coal without a corresponding increase in the number of workers. At the same time, this mechanicalization of the mines has been accompanied by increased hazards from falls of roof and coal and from accidents in transporting the coal from the face to the tipple. Incidentally, also, the machines have introduced new hazards peculiar to themselves, although these cannot be classed among the major causes of mine accidents.

"Progress in accident-prevention is indicated by either a larger output per accident or fewer accidents per employee; double progress is realized when increased production per accident accompanies a reduction in the accident rate per employee.

"I believe the publication of this handbook will prove helpful to safety engineers, mine owners, mine employees and others in their endeavor to obtain the nation's necessary fuel at a minimum cost in life and limb. The Bureau plans to revise the work from time to time as developments in the industry and further study and research seem to warrant."

Coal Produced in Colorado in 1925*

(Exclusive of Product of Wagon Mines)

County	Net Tons: Loaded at Mines for Shipment	Net Tons: Sold to Local Trade and Used by Employees	Net Tons: Used at Mines for Steam and Heat	Net Tons: Made Into Coke at Mines	Net Tons: Total Quantity	Value: Total	Value: Average per Ton	Number of Employees: Underground: Miners, Loaders and Shot-firers	Underground: Haulage and Track	Underground: All Others	Surface	Total	Average Number of Days Worked	Average Tons per Man per Day
Boulder.....	533,217	57,655	29,113	.....	619,985	$1,688,000	$2.72	471	83	92	97	743	172	4.86
Delta.....	43,026	27,094	.....	.....	70,120	198,000	2.82	53	....	11	25	89	146	5.41
Elbert and Jefferson..	89,923	4,696	9,468	.....	104,087	175,000	1.68	77	13	12	17	119	167	5.21
El Paso.....	144,447	142,878	9,315	.....	296,640	763,000	2.57	221	34	27	37	319	207	4.50
Fremont....	544,372	84,776	5,640	.....	634,788	2,539,000	4.00	808	152	157	192	1,309	185	2.62
Garfield....	11,314	18,799	150	.....	30,263	93,000	3.07	32	....	7	5	44	245	2.81
Gunnison...	484,973	3,992	24,915	.....	513,880	1,587,000	3.09	377	59	92	147	675	183	4.16
Huerfano...	2,068,380	17,491	16,599	.....	2,102,470	7,134,000	3.39	1,972	353	244	501	3,070	208	3.29
La Plata....	52,938	32,029	24	18,050	103,041	295,000	2.86	89	1	24	26	140	200	3.69
Las Animas.	2,804,151	44,965	45,830	91,331	2,986,277	8,451,000	2.83	2,598	438	327	521	3,882	217	3.54
Mesa.....	98,254	26,287	1,470	.....	126,011	309,000	2.45	127	19	15	29	190	180	3.68
Moffatt.....	.....	7,188	.....	.....	7,188	16,000	2.23	10	....	2	2	14	167	3.08
Montezuma	1,680	3,512	.....	.....	5,192	27,000	5.20	12	....	....	....	12	132	3.27
Rio Blanco..	.....	6,234	30	.....	6,264	21,000	3.35	13	....	1	2	16	230	1.71
Routt.....	951,400	14,148	44,155	.....	1,009,703	3,552,000	3.52	617	111	120	250	1,098	83†	11.09
Weld.....	1,566,835	29,224	28,063	.....	1,624,122	3,336,000	2.05	951	182	131	138	1,402	194	5.96
Other counties‡.	59,859	7,130	3,531	.....	70,520	138,000	1.96	46	8	7	20	81	193	4.49
Total.....	9,454,769	528,098	218,303	109,381	10,310,551	$30,322,000	2.94	8,472	1,453	1,269	2,009	13,203	189	4.07

* The figures relate only to active mines of commercial size that produced coal in 1925. The number of such mines in Colorado in 1925 was 229; in 1924 it was 231, and in 1923 it was 236.

† In this county the mines have in recent times followed the practice of reducing their forces in periods of dull market and of working every day underground when the tipple works only one, two, or three days a week. As the figures of days worked represent tipple time, the result is not comparable with the returns for other counties, and the average for the state also is affected.

‡ Archuleta, Jackson, Montrose and Pitkin.

Statistics compiled by U. S. Bureau of Mines.

Foreign Market And Export News

Crisis in French Coal Threatens Unless British Strike Ends

Paris, France, Aug. 26—Unless there is an early termination of the British coal strike, French consumers will face a serious situation this fall and winter. Reserve stocks are melting away and the French collieries are unable to increase production enough to offset these losses.

Every week some new development adds further increases to the soaring coal prices. Higher wages in the Loire basin have been followed by an advance in prices approximating 40 fr. August quotations on Saar coal are 20 to 23 fr. higher than the July figures. Increases in railroad rates, import duties and canal freight taxes swell the total delivered costs.

Negotiations between French metallurgical interests and German coke makers have resulted in an agreement that the same oven prices shall control open-market contracts and indemnity shipments of coke to France. This price will be subject to variation in accordance with rates of exchange and tonnages involved. The current fixed price is 16.80 mk. at the ovens, and the delivered price, including O. R. C. A. fees, approximates 241.25 fr.

Polish Exports Booming

Coal exports from Poland established a new record in July, when 1,835,000 tons were shipped. Compared with the June total of 1,395,000 tons, this was an increase of 31.54 per cent.

Nearly the whole of this increase was taken up by England, which bought 416,000 tons more than in June. This points, of course, to the fact that the end of the miners' strike in England will bring about a heavy drop in this item on the Polish exportation list. Yet it is to be expected that the whole effect will not be produced at a single stroke as coal stocks are exhausted all over Europe, and after the close of the strike it will take some time before stocks are filled up again.

In any case, there is much reason to be confident that new outlets for Polish coal, which were found before the strike in England, will prove to be permanent. Those sales, which have been increasing since July 1925, have made good the loss Poland at first suffered when in June, 1925, Germany closed her frontiers against coal from Polish Upper Silesia. It has also to be considered that after the conclusion of the commercial treaty between Germany and Poland, which is now under negotiation, at least part of the German market will be reopened for Polish coal.

In June and July the pressure on the ports of Danzig and of Gdynia was so heavy—those ports have also heavy importations of iron ore to deal with—that in July 560,000 tons of Polish coal had to be shipped in German ports, Hamburg taking the lion's share with 437,000 tons.

Feverish Activity Slackens At Hampton Roads

After more than two months of the greatest activity in their history, the Norfolk & Western coal piers at Lamberts Point, and the Virginian piers at Sewalls Point have dropped back to a 16-hour operating day, due to a slight slackening of demand for coal. The Chesapeake & Ohio piers at Newport News are now working a 24-hour day, but not at full speed. The three terminals dumped approximately 600,000 tons of coal for the first eight days of September, in spite of a slackening in demand, the bulk of the movement being a continuation of the British movement which began three months ago. Inquiries have dropped off slightly, though the price of coal at the piers has remained firm.

Soviet Coal Output Up in June

Industrial production in the Soviet Union for the first nine months of the current Soviet fiscal year, Oct. 1 to July 1, showed an increase of 42 per cent over the same period of last year, according to statistics just received from Moscow by the Russian Information Bureau at Washington. Substantial gains have been scored in all the principal industries. Industrial production in June, the last month of the period, was 4.1 per cent greater than in May and 30 per cent greater than in June, 1925. Coal production, 1,771,530 metric tons showed a gain of 11 per cent over May.

Passes Pre-War Output

The output of bituminous in the Ruhr district in the twenty-seven working days of July amounted to 10,173,691 tons, compared with 10,150,347 tons in July, 1913. Coke production was 1,765,322 tons and 2,110,412 tons respectively; bituminous briquets 316,968 tons and 448,659 tons.

Import Duties on Coal Reduced

Bituminous coal, when imported through Jugoslavian seaports, was included in a list of commodities upon which import duties were reduced by a decision of the Jugoslavian government, effective June 19.

Export Clearances, Week Ended Sept. 9

FROM HAMPTON ROADS

	Tons
For United Kingdom:	
Span Str. Arno Mendi	7,010
Br. Str. Charlbury	7,189
Br. Str. Maine	8,766
Br. Str. Penrose	5,843
Br. Str. Bellview	7,427
Br. Str. Blairesk	5,197
Br. Str. Ardenhall	7,289
Nor. Str. Romsdalshorn	9,330
Br. Str. Beachcliffe	7,301
Span. Str. Aizkaral	4,888
J. S. Str. Nikola Mikanovis	7,260
Ital. Str. Ansaldo Quarto	6,168
Ital. Str. Raffaello	5,032
Br. Str. Anglo Chilean	11,278
Br. Str. Trafalgar	6,968
Ital. Str. Ellenire	6,422
For Brazil:	
Br. Str. Tredinnick, for Santos	6,521
Br. Str. Golden Cape, for Rio de Janeiro	6,527
Br. Str. Portreath, for Pernambuco	4,834
Br. Str. Elmpark, for Bahia	2,683
Br. Str. Grelstone, for Para	6,075
For England:	
Br. Str. Scythian, for Manchester	6,907
Grk. Str. Emmanuel Stavroudis, for River Mersey	6,768
Br. Str. Conistone, for Avonmouth	7,064
Du. Str. Waalhaven, for Manchester	5,280
Grk. Str. Artemisia, for River Mersey	6,210
Br. Str. Pencarrow, for London	7,105
For Argentine:	
Dan. Str. Nevada, for Buenos Aires	5,062
Br. Str. Breynton, for Buenos Aires	5,993
For Spain:	
Swed. Str. Skaneland, for Barcelona	4,033
For West Africa:	
Ital. Str. Enrichetta, for Dakar	7,393
For Danish West Indies:	
Dan. Str. Kotonia, for Curacao	3,541
For Algeria:	
Ital. Str. Oceania, for Algiers	5,419
For Portugal:	
Br. Str. Chatham, for Lisbon	5,183

FROM BALTIMORE

For England (to Queenstown for orders):	
Dan. Str. Uranienborg	5,758
Br. Str. Kenilworth	8,418
Ital. Str. Angelo Toso	7,160
Br. Str. Bradclyde	7,755
Br. Str. Carlton	8,426
Br. Str. Oakworth	7,581
Br. Str. Simonburn	7,933
Br. Str. Medomsley	6,041
Span. Str. Atalaya	5,062
For Ireland:	
Br. Str. Amersham, for Cork	5,433
For Italy:	
Ital. Str. Concordia, for Civita Vecchia	8,801
Ital. Str. Ferento, for Genoa	7,979
For France:	
Nor. Str. Otta, for Nantes	4,590

FROM PHILADELPHIA

For United Kingdom:	
Br. Strs. Galtymore, Daybreak and Marsfield, Ital. Str. Clara Camus, Nor. Str. Vinland, Span. Strs. Artea Mendi and Ardantza Mendi	——
For West Indies:	
Amer. Strs. Glendoyle (for Caye Mambi) and Levisa (for Kingston), Nor. Str. Jose (for Kingston), Br. Str. Sheaf Field (for Habana)	——

Hampton Roads Coal Dumpings*

In Gross Tons

	Sept. 2	Sept. 9
N. & W. Piers, Lamberts Pt.:		
Tons dumped for week	196,401	244,055
Virginian Piers, Sewalls Pt.:		
Tons dumped for week	172,872	142,061
C. & O. Piers, Newport News:		
Tons dumped for week	186,809	202,666

*Data on cars on hand, tonnage on hand and tonnage waiting withheld due to shippers' protest.

Pier and Bunker Prices, Gross Tons

PIERS

	Sept. 2, 1926	Sept. 9, 1926†
Pool 1, New York	$5.35@$5.60	$5.35@$5.60
Pool 9, New York	4.85@ 5.10	**5.00@ 5.15**
Pool 10, New York	4.60@ 4.85	**4.90@ 5.10**
Pool 11, New York	4.35@ 4.50	4.35@ 4.50
Pool 9, Philadelphia	4.85@ 5.20	4.85@ 5.20
Pool 10, Philadelphia	4.60@ 4.85	4.60@ 4.85
Pool 11, Philadelphia	4.30@ 4.55	4.30@ 4.55
Pool 1, Hamp. Roads	5.40@ 5.50	**5.50@ 5.60**
Pool 2, Hamp. Roads	5.30	**5.35@ 5.40**
Pool 3, Hamp. Roads	4.80	**5.00@ 5.10**
Pools 5-6-7, Hamp. Rds.	5.25	***5.00@ 5.15***

BUNKERS

Pool 1, New York	$5.60@$5.85	$5.60@$5.85
Pool 9, New York	5.10@ 5.35	**5.25@ 5.40**
Pool 10, New York	4.85@ 5.10	**5.15@ 5.25**
Pool 11, New York	4.60@ 4.75	4.60@ 4.75
Pool 9, Philadelphia	5.10@ 5.35	5.10@ 5.35
Pool 10, Philadelphia	4.90@ 5.10	4.90@ 5.10
Pool 11, Philadelphia	4.55@ 4.85	4.55@ 4.85
Pool 1, Hamp. Roads	5.50	**5.60**
Pool 2, Hamp. Roads	5.40	5.40
Pools 5-6-7, Hamp. Rds.	5.30	***5.15***

† Advances over previous week shown in **heavy type**; declines in *italics*.

Coming Meetings

Pennsylvania Coal Mining Institute of Johnstown, Sept. 17, at Johnstown, Pa. Secretary, Wm. Fleming, Johnstown, Pa.

Joint convention of the Western Division of the **American Mining Congress, American Institute of Mining and Metallurgical Engineers, American Association of Petroleum Geologists** and **American Silver Producers' Association** at Denver, Colo., Sept. 20-24.

American Institute of Mining and Metallurgical Engineers. Oct. 6-9, at Pittsburgh, Pa. Secretary, H. Foster Bain, 29 West 39th St., New York City.

Kanawha Coal Operators' Association. Annual meeting Oct. 15, Charleston, West Va. Secretary, D. C. Kennedy, Charleston, West Va.

Canadian Institute of Mining and Metallurgy. Eighth annual western meeting, held jointly with the northwest section of the American Institute of Mining and Metallurgical Engineers, second week in October, Spokane, Wash., and Cranbrook, B. C. Secretary, British Columbia Division, H. Mortimer-Lamb, Birks Bldg., Vancouver, B. C.

Illinois Coal Traffic Bureau. Annual meeting Oct. 28, Fisher Bldg., Chicago, Ill. Traffic Manager, W. Y. Wildman, Fisher Bldg., Chicago, Ill.

National Safety Council. Oct. 25-29, at Detroit, Mich. Managing director, W. H. Cameron, 108 East Ohio St., Chicago, Ill.

National Conference of Business Paper Editors. Annual convention at Hotel Astor, New York City, Nov. 8-10. Secretary, D. G. Woolf, 334 Fourth Ave., New York City.

National Industrial Traffic League. Commodore Hotel, New York City, Nov. 17 and 18. Executive secretary, J. W. Beek, Chicago, Ill.

American Welding Society. Fall meeting Nov. 17-19, Buffalo, N. Y. Secretary, M. M. Kelly, 29 W. 39th St., New York City.

Coal Mining Institute of America. Annual meeting, Chamber of Commerce, Pittsburgh, Pa., Dec. 8, 9 and 10. Secretary, H. D. Mason, Jr., Box 604, Ebensburg, Pa.

Trade Literature

Red-E-Hall Portable Electric Pipe Machine. Hall-Will, Inc., Erie, Penn. Pp. 12.; 8x10 in.; illustrated. Tells of the economies in time and labor costs in using this machine.

Edison Lamp Works, Harrison, N. J. has issued the following bulletins: Bulletin LD-114C on **Theory and Characteristics of Mazda Lamps.** Bulletin LD-117C, **Calculation of the Lighting Installation.** Bulletin LD-108B (second edition) **Lighting of Offices and Drafting Rooms. LD-134A, Lighting of the Metal Working Industries.** Bulletin LD-141A, **Motor Car, Garage and Display Room Lighting.** These are all 6x9 in. and illustrated.

New Equipment

New Equipment for Battery Charging Announced

As a result of modifications of design, the General Electric Co. of Schenectady, N. Y., is now marketing a complete new line of battery-charging equipments in uniform frame sizes. These equipments consist of motor-generators and unit control sections. They are particularly applicable to the multiple charging of batteries used in storage-battery locomotives, electric industrial trucks, and electric motor trucks.

The motor-generators are designed to operate at speeds ranging from 1,800 r.p.m., for the sizes up to 35 kw., to 1,200 r.p.m. on larger sizes. Stocks will be carried of outfits for such special voltages at 32, 45, and 55, together with the standard 115-volt type.

Especial attention is said to have been paid to liberality of design. Commutators and brushes have ample capacity for the high currents required with respect to the kilowatt rating.

The generators are flat compounded between no load and three-quarter load, and have slightly drooping characteristics beyond the three-quarter load point. The rise in voltage between these two load points is comparatively small.

New Line Announced

A complete new line of unit control sections for these motor generators has been announced. These will be furnished either as part of the complete charging equipment or separately. They are of compact design, so that a large number of circuits may be controlled in a limited space.

The general line consists of two-circuit sections designed for manual control of the charging rate and the terminating of the charge by means of a contact-making ampere-hour meter located on the truck. Such a section includes, for each circuit, a dial switch for the resistor; a meter reading switch; an indicating lamp; a double-pole undercurrent and shunt-trip contactor with two auxiliary circuit contacts; a fuse mounted conveniently on the back of the board; and a resistor, also on the back of the board.

By means of the indicating lamp the operator can tell when the battery is connected to the section. The current is controlled and adjusted by turning the dial switch handle. Amperes and volts are read by means of a switch in connection with a voltmeter and ammeter common to all circuits.

Overcurrent protection is provided by the fuse, and protection against reversal is furnished by the undercurrent contactor. Automatic shut down at the end of the charge is accomplished by the shunt trip device which is an integral part of the under-current circuit breaker, this circuit being energized from the line and completed through an ampere-hour meter mounted on the electric truck or locomotive.

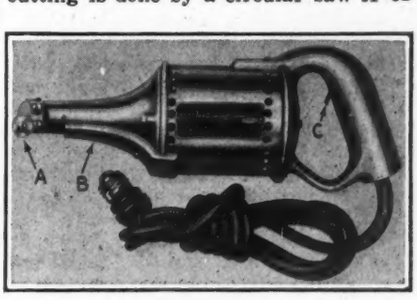
An important feature of the construction is the ease with which a single section with its two resistors may be removed in a unit if necessary. This is accomplished by removing four cap-screws at the corners of the panel and detaching the vertical busbars from the back of the resistor supports. The entire section may then be easily slid out.

Any number of control sections can be combined with generator sections to make a complete panel. Various modified forms of sections are available and will be furnished for any set of circumstances, thus covering every condition of battery charging.

Junior Commutator Slotter Portable and Light

To supplement the Aurand heavy-duty slotter for large commutators, which has been in service for a number of years, the Junior model shown in the accompanying illustration has been developed. This is a comparatively light portable tool, designed along the same lines as its predecessor, to be used on the smaller commutators or in plants where there is a limited amount of work to be done. It is particularly recommended for the industrial plant having a wide range of commutator sizes or as a tool to be carried in the kit of maintenance and repair men, the entire machine weighing approximately 5 pounds.

As shown in the illustration, the cutting is done by a circular saw *A* of



Weighs Less Than Five Pounds

Although this machine is small enough to be carried in the workman's tool bag it has a wide range of usefulness. In use the saw is started at the commutator radials and is then drawn along the segments toward their outer ends.

only $\frac{11}{16}$ in. diameter, which gives access to difficult places and permits the cut to be made right up to the radials. The saw is mounted on a mandrel carrying a worm gear connected to the motor by a steel driving shaft. This motor is of the universal series-wound type for use with either alternating or direct current. It is wound for 110, 220, 250 or 275 volts. The control for the machine is a trigger switch *C* in the handle.

In the cutting operation the saw is

placed at the radials and the tool drawn toward the outer edge of the bars. A fan mounted in front of the motor and discharging through the air vent *B* shown in the foreground, keeps the working field free of mica dust. The slotter is marketed by the Green Equipment Corp., Monadnock Block, Chicago.

Columbia Variable-Speed Transmission

A type of variable-speed transmission unit, which permits of minute adjustments of speed over a wide range, has been brought out recently by the Columbia Vari-Speed Co., 4020 West Lake St., Chicago, Ill. Fig. 1 shows a general view of the unit, while the section Fig. 2 shows the constructional features.

Power is transmitted in the unit by means of the traction between the hard metal surfaces of the rollers and races bearing against each other under high pressures. There are three rollers, *A*, which instead of being cylindrical, are tapered from the center toward each end, the profiles of the tapered sections being circular arcs. When the machine is in operation, the rollers move in planetary fashion about its axis, rolling around the inside of the two outer races *B* and *C* and around the outside of the two inner races *D*. The two outer races are secured against rotation, while the inner races are rotated by the input or constant-speed shaft *S*. Each roller is mounted in a yoke *G* and the yokes are carried on each of the three projecting shafts of spider *M*.

PROVIDES FOR SPEED VARIATION

The spider is therefore pulled around after the rollers as they move through their circular path between the races, and the output or variable shaft *R*, to which the spider is keyed, is thus rotated. The rollers will necessarily turn shaft *R* at a slower speed than that of the inner races, but the ratio of the speed of the inner races to that of the rollers depends on where the points of contact occur between the rollers and races. Thus, in order to vary the ratio of speeds between the input and output shafts, provision is made for shifting these points of contact. The manner in which the points of contact move in relation to each other is illustrated by the diagrams shown at the left of the sectional view.

In order to change the relative positions of the parts, the outer race *C* is mounted in a sliding frame *J*. It is made to move along the axis of the machine by turning the control wheel *O*. As the space between the outer races widens, the rollers are forced outward by the springs *E* which also cause the traction between the rollers and races.

The shaft *H*, on which are mounted the inner races together with the springs, forms a floating unit which is flexibly connected to the shaft *S* by the pins *I*. The ball thrust bearing *L* is placed behind the flange of sleeve *K* to facilitate turning the control wheel.

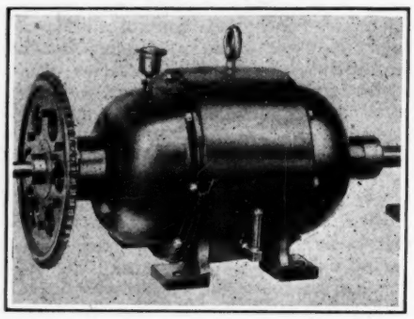


Fig. 1—Exterior View of Unit

This transmission is unusually small in comparison to its power. Thus a 3-hp. unit takes up less than 1 cu.ft.

Lubrication is effected by partly filling the casing with oil. The oil is thrown outward by the revolving rollers and is led to all working parts through a system of passages.

To meet the requirements of practice, a range such that the maximum speed is about equal to five times the minimum has been found sufficient, and standard units are designed to have this range. Any speed between these limits can be obtained by simply turning the control wheel. In cases where large reductions of speed are desired, gears are included within the housing.

Advantages claimed for this type of unit in addition to high efficiency are ready adjustment of speeds over a wide range, noiseless and vibrationless running at high speed, and small space required per unit of power delivered, a 3-hp. unit requiring less than a cubic foot of space.

There are many cases around the mines where different speeds are desired. Such a unit as the transmission here described will fill this need within its capacity range.

Publications Received

School of Mines and Metallurgy, University of Missouri, Rolla, Mo., has issued a 64-pp. bulletin on **Electrical Precipitation as Applied to Gas Streams,** by H. R. Hanley. It is 6x9 in. and illustrated.

Fuel Briquets in 1925, by James E. Black. Bureau of Mines, Washington, D. C. Pp. 5; tables. Price, 5c.

Annual Report of Coal Mine Inspection and Mine Rescue Departments of Kansas, 1925. Pp. 145; 6x9 in.; tables.

Can We Compete Abroad? by C. C. Martin. National Foreign Trade Council, New York City. Pp. 155; 5½x7½ in. A living narrative of actual experience and practice.

Mineral Resources for Future Populations, by F. G. Tryon and Lida Mann. Pollak Foundation for Economic Research, Newton, Mass. This is one of the nineteen chapters of "Population Problems in the United States and Canada," being Vol. 5 of the Pollak publications, published March, 1926, with 332 pp., the price being $4.

The Wage Policies of Labor Organizations in a Period of Industrial Depression, by V. J. Wyckoff, Ph.D. The Johns Hopkins Press, Baltimore, Md. Series XLIV, No. 3, Johns Hopkins Studies in Historical and Political Science, under the direction of the departments of history, political economy and political science. Price, $1. Pp. 119, 6x9 in.

Mineral Resources of the United States in 1925 (Preliminary Summary) Introduction by Frank J. Katz, statistics assembled by Martha B. Clark. Price, 20c. Superintendent of Documents, Government Printing Office, Washington, D. C. Pp. 120; 6x9 in.

Technical Studies of Groups of Coal Mines Destroyed in the Late War, by the Central Committee of the Coal Mines of France. Gauthier-Villars et Cie, Paris, France. Vol. II on cables has 191 pp. and Vol. III on machine extraction has 185 pp. Both volumes are 9x11 in. and illustrated.

Reducing Accidents in Coal Mines is the title of a book by the Policyholders' Service Bureau of the Metropolitan Life Insurance Co., New York City. Pp. 15; 8x10½ in.; illustrated. A safety survey of large coal mines made by the safety engineers of the Metropolitan Company.

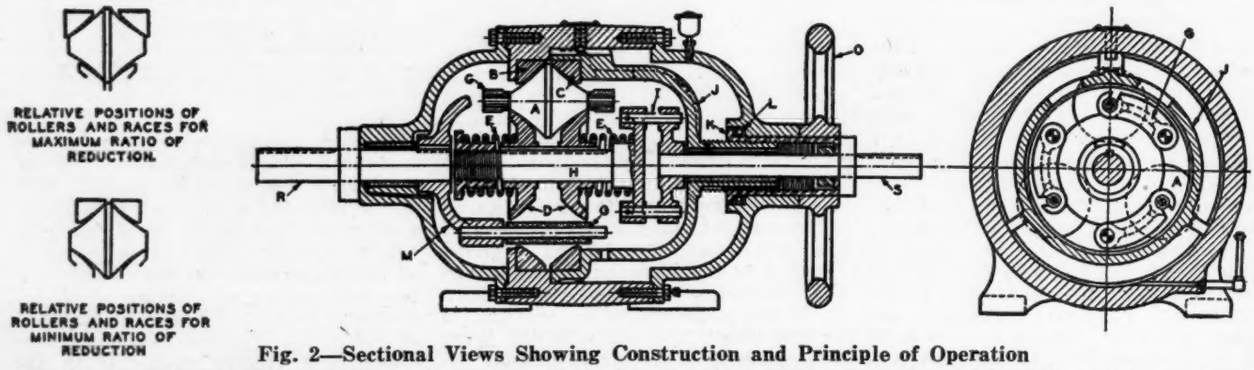


Fig. 2—Sectional Views Showing Construction and Principle of Operation

This is a friction-drive machine. Changes in speed through wide limits are secured by shifting the point of contact of the races upon the cones. This can be done from the outside of the machine by simply turning a handle wheel.